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Address of the President of the A. P. H. A.
W. A. Evans, M. D.

Food Conservation and the War
Herbert C. Hoover, Director, U. S. Food Administration

Health Problems of the Army
Surgeon General William C. Gorgas, U. S. A.

Health Problems of the Navy
Surgeon General W. C. Braisted, U. S. N.

Preservation of the Health of the Soldier on the Western Front
Col. T. H. Goodwin, C. M. G., D. S. O., R. A. M. C.

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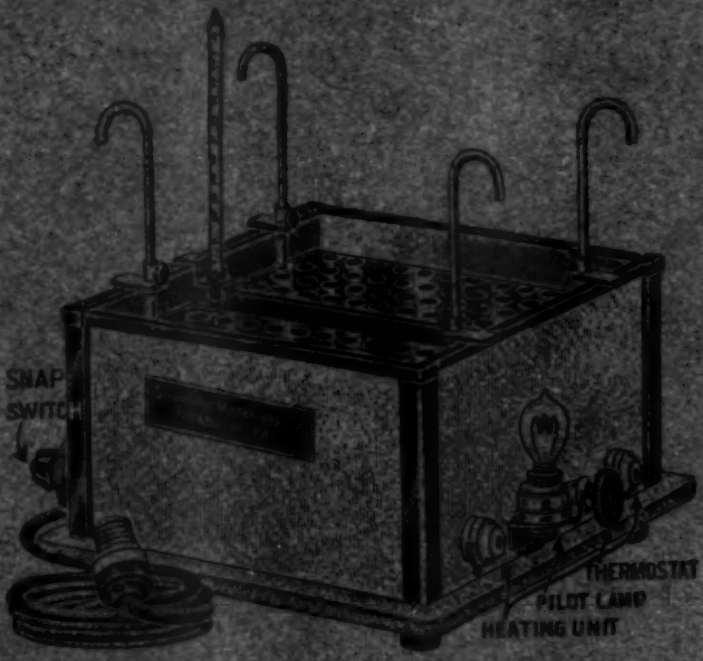

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American Journal of Public Health
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Vol. VII NOVEMBER, 1917 No. 11

ADDRESS OF PRESIDENT, AMERICAN PUBLIC HEALTH ASSOCIATION, OCTOBER 19, 1917.

W. A. Evans, M. D.

SUBJECTS.

1—Summary of Annual Report.
2—Military Hygiene of Cantonments in Relation to their Environments: Consideration of Certain Diseases—
a. Measles
b. Mumps
c. Pneumonia
d. Meningitis
e. Venereal Diseases
3—The Effect of the War on the Profession of Preventive Medicine and the American Public Health Association.

Summarized Report.

Ladies and Gentlemen of the American Public Health Association:

IN ADDRESSING the forty-fifth annual meeting of the American Public Health Association I wish, first, to thank you not only for bestowing the presidency upon me but also for supporting me in the discharge of the duties of the office.

During the year Canada has continued her part in the great world conflict and the United States and Cuba have taken position as her allies. These events with the internal troubles of Mexico, have served to add to the difficulties of our Association during the year.

When the United States entered the war we appointed a committee consisting of Doctors W. A. Evans, J. H. Landis, S. H. Gilliland, J. F. Anderson, J. D. Robertson, L. M. Powers, T. D. Tuttle, W. S. Leathers, and George Fuller which, with the secretary, sent out a questionnaire and placed the answers received at the service of the American government. I am informed that this material has been in constant use. This committee is still in existence ready to serve as called upon.

During the year your president and your first vice-president, representing your Association, were made members of the General Medical Board of the Medical Section of the Advisory Council of National Defense as well as members of some committees thereof. Your president was made chairman of

the sub-committee on Health of Workers of the Labor Section of the Advisory Council of National Defense and he, through Dr. E. R. Hayhurst, appointed nine sub-committees from the membership of the Section on Industrial Hygiene. The about fifty members drafted from this section have prepared a series of valuable reports which I hope will shortly be published by the Department of Labor of the United States government.

In mid-summer your tried and appreciated secretary and editor was appointed a member of the Commission on Tuberculosis to France. He esteemed it his duty to go and thus "do his bit" and we reluctantly gave our consent. He was lucky in that he was able to turn his office over to Mr. A. W. Hedrich who had been serving as his assistant. Mr. Hedrich has brought to the discharge of his duties great energy as well as capacity.

We have suffered by reason of the deaths of many valued members, two of whom I feel that I must mention—Dr. H. W. Conn, a member of the Executive Committee, and Dr. Henry D. Holton, a former president and valued counsellor.

The outstanding event of the year was the grant to us of $25,000 by the Metropolitan Life Insurance Company for propaganda work in improving the quality of health service throughout the country. Just as it was given, the United States plunged into war and your Executive Committee has not deemed it wise to organize the machinery for this work. It is not their plan to undertake this activity until, first, the proper man to manage it is found and, second, until the country is functioning along more normal lines. In their judgment such effort during 1917 would not have given proper return for the money invested.

I call your attention to but one change in Association policy. Thinking that the welfare of the Association demanded more thought than our directors have been able to give them in previous meetings of the Association, your officers arranged for a clear day for business meetings of the Board of Directors on the first day of the meeting. I reported an account of my stewardship, so far as the business of the Association was concerned, to the first meeting of the Board of Directors.

I shared with you, I am sure, the anticipation of the pleasure of a 1917 meeting in New Orleans but, after advising with the Executive Committee, I assumed the responsibility of changing the meeting place to Washington. Conditions engendered by the entrance of the United States into war made this desirable.

The Executive Committee has given the time necessary for holding several meetings since last year.

As your president I have had the privilege of visiting many local groups of health officers.

I recently visited the Canadian Health Association carrying your good wishes. I especially mention them in order to call your attention to this fact —40 per cent. of these men in attendance, upon the authority of Dr. J. D. Fitzgerald, secretary, were in uniform. This was because they are operating a scheme under which provincial and municipal health officers and local

health experts are taken into the service and then detailed to duty as sanitarians for military districts, in many instances coextensive with their civil jurisdictions.

Military Hygiene of Cantonments in Relation to Their Environments: Consideration of Certain Diseases.

I wish to bring to your attention certain phases of military hygiene and, especially, the relation of civilians, health officials and authorities thereto.

The Report of the Surgeon-General of the United States Army for 1916 shows that the army had a death-rate of 4.45 of which, the death-rate from disease was 2.53.

The Report of the Surgeon-General of the United States Navy for 1916 shows that that service had a death-rate of 4.48.

These rates indicate that the health of the military forces compares more than favorably with that of men of the same age periods in civil life.

The reports which come to us from the armies in the field in Europe are exceedingly meager but, such as they are, they indicate very definitely that the death-rate from disease in this war, instead of being twelve times as high as that from wounds as in some wars or even four times as high as in most wars, will be less. Such reports as we are able to get from Germany and England indicate that the disease death-rate of soldiers and sailors will be lower than that in the Franco-German War or the Russo-Japanese War —the two wars in which the proportion of deaths from disease to deaths from wounds was notoriously low.

Among the accomplishments of this war are to be noted: the great reduction in tetanus due to wounds; the improved treatment of infected wounds; the improved treatment of burns; possibly the discovery of a specific for infections by gas bacilli; all in the field of surgery. The control of enteric diseases and, especially, typhoid, paratyphoid and cholera, and of typhus—all in the field of medicine.

Among problems remaining to be solved are those due to tuberculosis, trench fever, trench foot, trench jaundice, war nephritis, shell shock and gas poisoning. Possibly also, the European armies have been unexpectedly unable to cope with malaria.

The field of the sanitarian with the troops in the field is an interesting one, but I wish especially to direct your attention to the problems of keeping healthy the men in training in cantonments in various parts of the country. An editorial in the United States *Naval Medical Bulletin* for July, 1917, contains this statement: "Face to face with the enormous menace of the civilian population to our military service, when the former begins to flow in considerable bulk into the latter, we must prepare to meet the inevitable and contend against it as best we can." This I find to be in substance the opinions of both Army and Navy health officials. A study of the death-rates and such sickness rates as are available indicates that the fears of these gentlemen are well founded. May I ask for them an exhibition of patriotism on the part of civilian sanitarians in remedying the conditions complained of?

I wish especially to direct your attention to four diseases—measles, mumps, meningitis and pneumonia, and a group of diseases—the so-called venereal diseases. Each of these is a source of great disability and damage to military commands, especially in training and, so far as control is concerned, each is neglected by local and state health departments. So far as the men in training are concerned we can dismiss as of small consequence all of the diseases that can be vaccinated against. This includes smallpox, typhoid fever and paratyphoid, and tetanus. We can put aside, I am sure, all water-borne diseases and other diseases due to infection through the enteric tract. We can put aside typhus. Diphtheria is not of maximum importance, because of the large percentage of soldiers immune to the disease,—at times as high as 80 per cent., according to Nicoll.

Measles.—According to the report of the Surgeon-General of the Navy in 1915 measles was responsible for 7,472 sick days, ranking fifteenth among diseases. The 1916 Report of the Surgeon-General of the Army says: "Given the proper combination of season, crowding, bad barracks, etc., in a command of recruits, an epidemic of measles is more to be feared than smallpox. The chief factor in the spread has resulted almost always from overcrowding of susceptible and infected recruits."

All ordinary methods for the control of these epidemics have proved unavailing. Important as measles is to an army in the field the disease is a far greater menace to troops in training. In 1916 measles on the frontier was closely studied and reported on by Munson. The disease was everywhere controlled except in two commands. The officers, line and medical, of these commands were strongly condemned in this which I think is an epoch-marking report.

As the result of this experience Munson says: "Measles is a thoroughly preventable and controllable disease. Epidemic measles hereafter should be a reproach to the commander or medical officer concerned, a reflection of their efficiency and a cause for official investigation and discipline. . . . The writer," still quoting Munson, "desires to emphasize his absolute conviction that the long-accepted classification of measles as one of the eruptive fevers puts it in the wrong nosological category. It should be classed as an acute respiratory disease."

In the commands investigated by Munson 60.8 per cent. of the men had had measles, 16.2 per cent. had not had it, the remainder were unaccounted for for one reason or another. Of the 2,222 who were susceptible 444 had the disease. In a group of 1,739 susceptibles in commands where orders for the control of measles were carried out only 6 per cent. developed the disease. In the two commands the officers of which were condemned 264 men out of 482 susceptibles, or 54 per cent., had the disease. I submit that this rate among susceptible contacts is lower than in any previous experience.

Munson in the *Military Surgeon* for September, 1917, gives 28 procedures to be carried out, many of which could

be administered unchanged by civil authorities and some could be administered when modified to fit civilian conditions. The method consists essentially in early diagnosis and strict isolation. In order to secure early diagnosis all colds, coryzas and minor disorders are made reportable when measles is threatening. The men are looked over by the surgeon daily.

To Munson's suggestions there is nothing to add except two points neither of which is covered in the 28 rules but both of which I am sure were made use of by the physicians immediately in charge as well as by Doctor Munson. First, an examination of the mouth for Koplik's spots will frequently reveal the presence of measles some days in advance of the onset of other symptoms. Chesley, in inspecting school children for measles, has the examiner place himself near a window and the children approach the light with their mouths opened wide. Koplik's spots are easily detected. The method is rapid. A few minutes serves for the examination of a room of students. The second point is this—company commanders might advantageously have a record of each soldier as to measles, mumps and German measles. Such a record would be of great service in controlling measles in camp.

Mumps.—I know of no health department that even claims to have a mumps policy. Control of the disease would cost more than such control would save. But when army camps are distributed throughout the country it becomes the duty of local health departments to attempt to control the disease because of the harm that it does to troops in training.

I wish to bring three points to the attention of military and civil health authorities.

A register of the mumps history of pupils in schools and of soldiers would be of value in the control of the disease. There is some authority for the view that the first local sign of mumps is redness in the mouth and pharnyx and that the parotid and other salivary glands do not become involved until such time as the infection has travelled up the secretory duct to the gland or glands.

The frequency with which parotitis is a complication of various infection lends support to this view. We might find that a systematic daily superficial examination of the mouths of suspects and the mildly ill similar to that advised for the detection of Koplik's spots would reveal the disease in its very earliest stage—before the onset of the outstanding symptom—enlargement of the parotid gland. With the onset of the fever there is at first a leucocytosis and then a lymphocytosis. Wollstein says that a lymphocyte increase of 7 to 10 per cent. precedes the enlargement of the parotid. Edwards quotes Wile as saying that a lymphocytis of 50 per cent. is pathognomonic.

Hess has been able to produce immunity against mumps by the intramuscular injection of 60 to 80 cc. of blood taken from persons with an acquired immunity to mumps.

It is not too much to hope that closer study of this neglected disease will develop that it can be habitually diagnosed prior to the onset of swelling.

The report of the Surgeon-General of the United States Navy shows that mumps in 1915 ranked fifth among diseases as the cause of sick days. The admission rate for mumps was 7.37; of measles, 5.52. The mumps admission rate in the United States Army for the same year was 9.80.

Pneumonia.—One of the major problems of health departments is, or should be, the pneumonia problem. The researches of Cole, Dochez and others by demonstrating that the types of pneumococci upon which pneumonia usually depends are not the types in the mouths of well persons, brings efforts to isolate and control persons capable of spreading pneumonia and to destroy their nose and mouth secretions, within the range of the possible. Bacteriologic diagnosis and serum therapy based thereon is in operation in at least one city—New York. The remainder of the country will watch their experiment with interest.

I wish to especially call your attention to a report made by Nicoll as the result of his experience with an epidemic of pneumonia at Fort Bliss, Texas, in 1916. This report, well worth your study, is to be found in the *Military Surgeon* for August, 1917. His conclusions were:

1. Epidemic pneumonia is to be expected in large camps in the winter months.

2. The disease is principally due to pneumococci of types I and II.

3. Serum treatment has produced excellent results in reducing mortality.

4. Direct evidence of tent, company and regimental contagion has been obtained.

5. Vaccination is considered a more promising measure of prevention than isolation.

I wish especially to draw your attention to the last recommendation. Nicoll says that vaccination should be done at the beginning of the pneumonia season. If thought advisable the vaccine used can be a combined pneumococcus and meningococcus vaccine.

Lister vaccinated men with 6,000 million dead pneumococci using three injections at seven-day intervals. He thought an immunity lasting eight months was produced.

The Surgeon-General of the Navy's report shows that in 1915 pneumonia was responsible for 9,156 sick days, ranking fourteenth. Gatewood says this disease is responsible for a damage rate of 1,467. In civil life pneumonia is responsible for one of the heaviest of all death-rates.

Cerebrospinal Meningitis.—One of the vivid recollections of my early childhood is of an epidemic of meningitis brought to the small community in which I lived by United States troops in barracks. In addition to the large number of deaths occasioned the community was left with a considerable number of one-eyed, blind and deaf persons among those who escaped with their lives. Furthermore, since that time meningitis has been mildly endemic in that community.

Meningitis is a disease of armies in the forming rather than of armies in the field. The opinion of the navy authorities is revealed in the following quotation from the United States *Naval Medical Bulletin* for July, 1917:

"When we consider how constantly the assemblage in barracks and camps of large numbers of young men of susceptible age is marked by an outbreak of cerebrospinal meningitis."

Rosenau says: "Cerebrospinal fever is a disease of soldiers living in barracks, garrisons, towns and camps rather than in the field. Crowding is the chief hygienic factor responsible for its spread."

Among the million or more men in training this winter there will be a considerable number of chronic meningococcus carriers. These are certain to infect their roommates. The number of men in a room will vary from 30 to 140. I am informed that the cubic feet of air space in these rooms varies from 250 to 400. The provision for heating and ventilation appears to me to be inadequate in those camps of which I have knowledge.

In view of these facts and the further fact that most of the training will be done in winter we must admire the wisdom of the authorities in deciding to locate the training camps in the South, in so far as was possible. The danger to the soldiers in training will be from colds and other infections through the nose in far greater measure than to infections through the enteric tract conveyed by water, food, milk and flies.

We can learn from the experiences with meningitis of the English, Canadian and Australian Army and Navy Corps. On February 24, 1917, Parkes (*British Medical Journal*) wrote that the method of controlling meningitis now used in the British Army has resulted in complete control of the disease. Rolleston on the 13th day of January, 1917 (*Lancet*), reported to the same effect for the British Navy.

On February 10, 1917, the *Lancet*, in an editorial, gave the methods for the control of cerebrospinal meningitis in the Army and Navy:

THE METHODS WHICH HAVE BROUGHT CEREBROSPINAL MENINGITIS COMPLETELY UNDER CONTROL.

These methods are as follows:

All recruits have a bacteriologic examination made of the nasopharynx before being allowed to mingle with the command. All those found to bear meningococci are isolated until their noses have been freed from this coccus.

Upon the development of a case of meningitis all contacts are isolated and bacteriologic examinations of the nasopharynx are made.

There are at least four strains of meningococci. Future action is somewhat modified according as the strain of meningococci found (when any are found) is the same as that in the case with which the soldier was in contact.

Diagnosis of meningitis is made by symptoms, by lumbar puncture, and microscopical, chemical and bacteriologic examination of the fluid, and by bacteriologic examination of the nasopharynx. Treatment is by lumbar puncture, injection of meningococcus serum, ventricular puncture in certain cases and by symptomatic treatment. Cases are isolated. The noses of cases, infected contacts and carriers are cleared up by local treatment. In cases where the nose is but mildly infected and the infection seems to be limited to the lower passages ordinary washing and douching of the nose with salt solution or permanganate solution is effective. This method is only effective in a limited number of cases. A more efficient method consists in the injection of chloramine oil.

The oil method as given by Flexner and Dunham and Dakin is as follows: The nose is cleaned with salt solution or 0.25 per cent. aqueous chloramin-T solution either by spraying or by irrigation. The nose is blown into a handkerchief between applications; and the chloramin-T solution is used thoroughly as a gargle.

2. When the increased flow of secretion from the nose has subsided the oil solution of dichloramin-T is applied with an oil atomizer. The oil spray is repeated at intervals so as to make at least four treatments daily about equally spaced from each other. The spraying should be thorough and the oil carried to all parts of the membrane accessible.

Gordon and Flack hold that most nose washes and sprays are ineffective and that the reason is that the cocci are in recesses unreached by such methods. In order to overcome this objection they devised a modification of the Falmouth atomizer. This throws a very fine mist of a watery solution of zinc chloride (1 per cent.) or preferably a solution of chloramin (1½ per cent.). A treatment room with a 750 cubic foot air capacity was built. The persons under treatment reclined on a cot in this room for 20 minutes, one treatment a day was given, one litre of the solution was sprayed in 15 to 20 minutes.

Most persons whose nasopharynges become infected clear up spontaneously in a few days or a few weeks. Some remain infected for months. Some become chronic carriers.

Gordon and Flack, after making proper allowance for the tendency of cases to spontaneously clear up, are of the opinion that the method devised by them is of distinct value.

One by-effect of the studies made of meningitis is much valuable information on the efficacy of nose washes and sprays in rendering the nasal mucous membrane sterile. I think it has been proven that systematic examination of the noses of recruits, so far from crippling the purely military work of a military establishment, forwards it. It shortens the periods of detention of the great majority of those affected, permitting the release of the majority within three days. In addition it protects against outbreaks. The effort more than pays for the expenditure.

Kenwood says: "Everyone will agree that circumstances leading to better air conditions at night and drier feet by day must greatly reduce the prevalence of invaliding. These catarrhal conditions unfit men for their training, lower resistance to several forms of disease and (as I believe) have been intimately associated with the high incidence of spotted fever among our troops. One cannot but be struck by the general coincidence of the prevalence of this cerebrospinal fever and a high sick rate from catarrhal affections; this may be due to a common predisposing cause but it is probable that catarrhal conditions predispose to spotted fever, possibly exalt its virulence and also favor its spread and that they are sometimes abortive cases of the disease. Furthermore, histories of outbreaks of spotted fever in civil communities show that they are usually associated with overcrowding and the attendant lack of cleanliness and ventilation and when spotted fever occurs we have learned the value of at once allowing more cubic space both to sufferers and contacts. And so it would appear that whenever catarrhal conditions are unduly prevalent amongst our soldiers it would be a wise precaution to let this fact serve as a signal for increased ventilation."

Permit me the following reflections concerning measures for the control of measles, mumps, pneumonia and meningitis:

The great problem of military medical authorities in the wars of the last quarter century has been to improve sanitation. Just as we are getting sanitation on a satisfactory plane the need for it is in great part removed by the general use of typhoid and paratyphoid vaccines. The Japanese rightly claim more credit for their low enteric rates in the Russo-Japanese War where they did not use vaccines than is due to the sanitarians of the present armies whose low rates are in greatest part due to vaccines.

It is plain that our troops in training will not suffer greatly from poor sanitation. Not only do the army surgeons know what is good sanitation but line officers not only know what it is but they want to have it enforced. More important still the men in the ranks, even the raw recruits, have learned the lesson.

The time has come to give to the methods for the prevention of dis-

eases contracted through the nasopharynx as much attention as is given to those for the prevention of diseases contracted through the intestines. A part of such a method will consist in plans against measles, mumps, meningitis and pneumonia as already outlined.

I would suggest that to each command there be attached at least one comfort officer. It would be the duty of this man, or men, squad or detachment, to see that barracks were ventilated. Not only that there was provision for ventilation but that ventilation was carried out. To see that heating was right in practice as well as in planning. To see that there was no overcrowding night or day, in camp or out. To see that the men had enough blankets, that they slept warm, that they had enough clothes—warm enough but not too warm. To see that the colds rate was kept down—for in the wake of a high colds rate there is apt to come an epidemic of measles, mumps, meningitis or pneumonia. I think I would even go so far as to say, should it become necessary in order to provide a comfort detail, to lessen, in some measure the sanitary command, then lessen it.

Venereal Disease.—Venereal disease is responsible for a greater disability rate in both armies in the field and armies in training, than any other disease or group of diseases closely allied to each other. In the United States Navy they were responsible for 10,186 sick days in 1915, ranking first. The damage rate was 22.08. The army admission rate was 103.52, the next highest rate being tonsilitis—42.44. The reports by Osler and the *British Medical Journal* as to England, of Hecht and Moldavan as to Austria and of the *Deut. Med. Wochenschrift* as to Germany indicate that none of the combatants are succeeding in controlling venereal disease in the sense that typhoid or even tuberculosis is being controlled.

The prevention of these diseases in European armies since the war began is not altogether satisfying. Our own government, through its War Board, has taken the most advanced ground in the fight against these diseases that has ever been taken by any government. Our military surgeons and our philanthropic organizations are unusually active. Behind all of this is a powerful public sentiment. I think we can feel that the military are covering their part of the problem.

Of the Austrian troops infected with venereal disease the *British Medical Journal* says that 80 per cent. were infected in the interior and 20 per cent. at the front. With regard to the 80 per cent. the problem was one with which the local authorities had to deal. Moldavan gives the figures as 5 per cent. infected at the front, 20 per cent. on the lines of communications and 75 per cent. outside the sphere of the army.

This is the time for the initiation of venereal disease control directly and indirectly by municipal health and police departments. While such efforts should be especially urged upon communities within easy reach of camps it should not be limited to these. It is reasonably certain that sailors and soldiers have a much lower venereal

disease rate than men at the same age periods in civil life. A military command cannot be kept free from contagion if contagion control is neglected in its environs. This is as true of syphilis and gonorrhœa as it is of scarlet fever and measles.

Not as an individual but as president of this Association I urge local health departments to class syphilis and gonorrhœa as contagious diseases and to undertake their control. I urge police departments to lend aid by repressing prostitution. Rosenau says: "The coöperation of the civil authorities in an effective zone about all camps, recruiting stations and other military places is essential."

I suggest that military commands establish a venereal disease norm for the troops in cantonments and barracks.

Gatewood gives the venereal sickness percentage rate of the navy as ranging from 0.5 to 0.7 per cent. Chamberlain gives it as 16 per cent. of a sickness rate of about 2 per cent. or approximately 0.2 per cent. Perhaps a rate of 0.5 per cent. would be right as a preliminary norm. It would be highly desirable to have a norm for the civil communities surrounding the camps but, obviously, this is impossible. The rate in the military establishment must serve as the gauge for estimating conditions both in the military establishment and in the surrounding country.

Whenever the amount of venereal disease surpasses this norm long leaves should be refused or sparingly allowed, venereal prophylaxis should be stressed, moral and educational prophylaxis should be redoubled.

To this I would add the advice that the preventive packet consisting of soap, some silver solution and some mercury ointment, be used whenever the soldier or sailor exposed is not to reach the prophylactic station within twelve hours. Reports by Holcomb, Riggs and Vedder indicate that about 7 per cent. of soldiers and sailors who expose themselves become infected with venereal disease. When prophylactic is used within an hour the percentage of infectives is 0.08. When used ten hours after exposure the rate is about 6.6 per cent. Nothing is gained by the use of prophylaxis after twelve hours. It is, therefore, advisable to have persons who are not to reach the prophylactic station until more than six hours after exposure to use the prophylactic packet. The report of the Surgeon-General of the Army says: "For the use of troops serving on the border and for detached service when the usual prophylactic cannot be given it is recommended that the prophylactic tubes formerly authorized be again issued."

But a program as limited as the above must prove disappointing. Whenever the rate rises above the norm the civil authorities and the philanthropic and social agencies in the civil communities surrounding the cantonment barracks should be called upon by the military forces and with some authority and insistence, if need be, discharge their duties. The city councils and health departments should provide for venereal disease dispensaries, laboratory diagnosis of venereal disease, free salvarsan or its substitute and other free treatment of

venereal disease, repression of drug counter treatment, venereal disease quacks and venereal disease quack remedies and, in some instances, reporting of syphilis, gonorrhœa and chancroid. The program begotten of the war and now being installed in Great Britain is called to your attention.

The city councils and police departments should be called upon to repress prostitution. The newspapers should be called upon to censor their advertising columns and to help in their editorial columns. The philanthropic and social agencies should be stimulated in their activities.

To sum up: Patriotism as well as a proper regard for the obligations of officials and for the duties of life by other health authorities demand that the civil authorities make their communities safe for soldiers and sailors and civilians against measles, mumps, pneumonia, meningitis—and may I add, colds—and venereal disease.

Effect of the War on the Profession of Preventive Medicine and the American Public Health Association.

I do not think it requires much vision to see that out of this war will come a great increase in public health work. Preventive medicine is justifying itself and will continue to do so. Civil communities will not be slow to apply this to themselves. Thus will be created a greater demand for preventive medicine work and preventive medicine workers. A million, or perhaps several million, soldiers trained in personal hygiene and sanitation will be returned to the walks of private life. Inevitably, these men, banded together as they will be, as the Grand Army has been, will be the most powerful political force in the country. They will be sympathetic toward work in personal hygiene, in group hygiene and in sanitation.

There will be twenty thousand, and maybe forty or fifty thousand, physicians in the army and navy. A part of these will be practising curative medicine and surgery exclusively. A large number, let us say more than half, will go back into private life trained hygienists and sanitarians. These men will be available for positions as health officers. They will fill most of the places now filled by untrained men and, of course, thousands of other places. In addition to these, our engineers and bacteriologists and nurses will have had a vast experience and valuable training.

In the wake of the war some form of health insurance will come. Even though the prevention of disease should be more than incidental in the measure adopted the effect on preventive medicine will be great. Should the health insurance measures develop disease prevention as a prominent feature of the plan the effect on the profession of preventive medicine will be greater still.

To my mind, it is evident that the adoption of health insurance will do for the profession of preventive medicine what the adoption of workmen's compensation laws did for the Safety First movement and for the profession of industrial hygiene, and for the same reasons.

If, now, ladies and gentlemen, the above conclusions are correct then they logically form the basis for another conclusion. The opportunity of the American Public Health Association is at hand. If we carefully analyze the trend of events, if we carefully study the history of other organizations and if we plan on the basis of these analyses to properly serve the interests of the people, of public health and of our profession, their material welfare, their freedom from hazards and their opportunities, we should be able to build up an organization quite as strong in numbers and in influence as those which draw their membership from other professions or those which are supported by the practitioners of curative medicine.

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FOOD CONSERVATION AND THE WAR.

HERBERT C. HOOVER,
Director, United States Food Administration.

Address before the American Public Health Association, October 19, 1917, at Washington, D. C.

I AM glad to have this opportunity, not to deliver you an address but for a discussion, and in order that you may have some grasp of what our problem is, I wish to outline to you something of the food necessities of the world at the present moment.

As you are aware, we are suffering from an enormous shortage in shipping. The consequence of that is to drive the shipping of the world on to the shortest routes and to force our allies to procure their foodstuffs from the nearest market. Practically the more remote food markets of the world are at the present time isolated. Our allies, in pre-war times, were largely dependent upon imports for their food supply. They imported a matter of three quarters of a billion of bushels of grain annually; and now, due to the diversion of men to war and of women to the workshops, their own productive capacity in foodstuffs has very materially diminished. That diminution pictures itself this year in a shortage in their combined harvests of upward of five hundred million bushels of grain; therefore, if we are to maintain even a reduced consumption in grain of the allied countries, there is thrust upon us the duty of supplying the major part of a billion bushels of grain. You can perhaps appreciate what a gigantic load that is if you bear in mind that our average pre-war exports from the United States were only one hundred and twenty-five million bushels. Much the same situation exists as to other foodstuffs.

We will have to accomplish that particular problem from many directions, in the first place, a stimulation of production in the United States and Canada. That has been attained with the exception of one cereal during the past year. Our wheat harvest is below normal; our other cereal harvests are above normal. Beyond that, the allies must reduce their food consumption to a very extraordinary degree. Those measures have been taken all over the allied countries. They are receiving an average food intake at the present moment of which the American public have no appreciation whatever. We can contribute greatly to this whole problem if we can reduce the consumption of foodstuffs in this country. The problem of reducing consumption has a fortunate phase for us. The limited shipping requires the shipment of the most concentrated forms of food; we must ship cereals, we must ship meat, pork products and dairy products; practically nothing else can be afforded. We have this year an abundant harvest, an abundant crop of all the vegetables; we are, therefore, in position to substitute vegetables for the other commodi-

ties that we must transport abroad. Further than that, we have a corn crop, this year, without parallel in our history, and we can, to a considerable degree, moderate their position if we can substitute corn for wheat. A certain basic amount of wheat is necessary for all populations. I will not go into the dietetics of the matter; the problem is largely not dietetic but psychologic and a matter of equipment. I may state generally that France and England have always lived on baker's bread, that there is practically no home baking of consequence on the continent; that there is no equipment for home baking. The manufacture of corn bread and the distribution of corn bread is an impossibility from bakeries; such bread is not a bread of sufficient endurance. Further than that, they have never eaten corn and, therefore, have no milling capacity for corn meal; and corn meal, itself, transported abroad, is not sufficiently durable to stand the period of distribution without deterioration. Therefore, we must supply our allies with a certain basic amount of wheat. They are asking us to supply 60 per cent. of their bread requirements. They are mixing corn, peanut meal, soy-bean meal, cotton-seed meal, barley, rye and potatoes for the other 40 per cent. Their bread is a war bread and a bread of tears and privation. We can be of the most material assistance if we can substitute cereals to which we are accustomed for wheat to send to them, sufficient for the basis of their loaf.

Beyond the problem of cereals, we have a problem of meats and fats. In the matter of meat, we can substitute fish, for we have an abundance of fish; we have only to take it from the sea, and we have made every arrangement to increase our production.

All can substitute poultry, etc., to some degree. In the matter of fats, we can offer no substitution but we can offer some advice. We have recently completed a very accurate series of computations on the fat consumption of the American people; taking the basic position of the number of hogs and cattle that go to market, taking the production of our vegetable oils that go into edible products, and our dairy produce, and we find the astonishing fact that the consumption of the American people in fats is over 150 grams per person per diem. In Belgium we have fed for three years a population of 10,000,000 people and maintained public health on a ration of 40 grams. The present German ration is but little over 30 grams; therefore we are the greatest wasters of fat under the sun, and it is no hardship and it is no nutritional danger to the American people that we should reduce our fat consumption, and it is only by virtue of a direct reduction that we can hope to supply the demands for fat necessary to maintain the public health in the allied countries during the coming winter. Prior to the war we exported a matter of about five hundred million pounds of fat products per annum. During the last year we exported a billion and a half. During this year we wish to raise those exports to over two billion. If we could secure a reduction in our American consumption by 5 per cent., we would be able to accomplish that problem.

There is a phase of all conservation, and that is the phase of *waste*. Amongst 30 per cent. of our households there is an enormous waste. In 70 per cent. of our households, especially at these high prices, there is a sufficiency of thrift to guarantee but little loss or waste of foodstuffs, but in the remaining 30 per cent. there is a waste which, if it alone could be curtailed, would accomplish two thirds of the problem we have to solve.

All these problems have a health value. I understand from our medical advisers that there has been a steady increase in nutritional diseases in this country for the last thirty years. The efforts made by your body and the people associated with you in public health work have produced marvelous results in infectious diseases, but the constantly increasing consumption of foodstuffs in the United States is probably responsible more than any one other factor for the increase in nutritional diseases. Therefore, if we could get a reduction in consumption we are attacking a public health problem as well as a war and economic problem. We have carried on in Belgium during the last three years the most gigantic laboratory in nutritional matters that the world has yet seen. We have found that we can maintain the public health on a matter of 60 grams of protein, of 40 grams of fats and 300 grams of carbohydrates. A large portion of the time we did not attain that ration, and that ration represents very much less than the food intake of the American people. We found that we had improved the public health; we found a decrease in all nutritional diseases during the progress of the relief. We found by the special care given to the children and the special adjustment of their diet, that we improved the health of all the children under four years of age. The infant mortality in Belgium has never been so low as it was when the Americans were compelled to retire last February. We found, as an incident to that work, some things that had not been recognized by nutritional experts hitherto. One of them was that adolescent children require a larger proportion of fats than adults. We had all of the population over six years of age practically on a uniform ration of fats. We found a gradually increasing amount of tubercular diseases in the adolescent children, and after some study we concluded that it was probably the shortage in fats and we at least determined to attempt a remedy in that direction. We assembled all of the children of adolescent years in schools for a meal, once a day, comprised of a majority of fats as an extra ration, and we got an immediate response in the tuberculosis percentage of the country. To sum it up, the lesson that we obtained out of the entire experience is that over-feeding is one of the greatest dangers to public health; and therefore, if, in the course of our work, a work undertaken with war objectives, we can secure a reduction in the scale of living in the United States, a reduction in the amount of food intake, we believe that we will have accomplished a great deal toward public health as well.

Now in that matter you can be of the most material assistance to the

Food Administration, if to this work, which is primarily a work of war and self defense, you can give the added value of a public health work; if you can preach it morning, noon and night as a sound doctrine for the advantage of each individual in the country, you will have placed behind us a background that we cannot otherwise obtain.

The problem of the conservation of foodstuffs has other values, the principal of which is the matter of saving. Wars are not paid for out of the capital of a people; we must pay for them out of our savings. The first issue, and perhaps the second, to a considerable degree, of liberty loans, may be met out of our accumulated savings, but if we are to go on with the war, if we are to find these increasing taxes and if we are to find further subscriptions for liberty loans they can only be found from an economic point of view, in the savings of a people. The volume of saving amongst the American people today is not large enough to carry this financial burden, and we must secure, in many directions, a reduction in expenditure amongst our people. We must not only secure a reduction in the consumption of foodstuffs, but we must secure a diversion of labor from non-productive work to productive work. Those are perhaps side issues but they bear on the conduct of every household in the country. Our food budget is our largest and, therefore, should be our first point of attack. If we can reduce the food consumption or the food waste, alternatively, in the American public, by six cents per capita, per diem, we will have saved two billion dollars per annum, or 10 per cent. of the cost of the war. There are other values still. There are the moral values of temperate living, so that we feel *en masse* that if we can secure a proper conservation of the food supplies of this country, we will have made it possible to feed our allies—a vital issue to winning the war—we will have improved the public health of our people, we will have increased our savings and our financial ability to carry on the war, and we will have improved the moral stimulus of the people as a whole.

We have no powers in law to effect conservation except such conservation measures as we can compass through trade handling. We have no right, nor have we ever wished for any right to influence the American household other than by its voluntary effort. Conservation measures abroad are being accomplished by the force of law and by the force of the police. The waste of bread in England, France, Germany and Italy today is punishable by fines, as much as $250 for every offense. We wish for no such system in this country. It is our belief that that foundation of democracy is individual initiative, and if the faith is worth defense, democracy can and will rise to defend itself. Also it must do this and still preserve the individual initiative of the people, and we can only secure and maintain that initiative if we can create these agencies and effect these results by the voluntary effort of every man, woman and child in the United States. The problem of conservation is a problem of twenty mil-

lion kitchens, twenty million tables; it is the act of every individual three times a day. There is no real conservation without reduction in consumption and the elimination of personal waste. For if we eliminate all the waste of trade, and we are rapidly eliminating them all, even then we can save probably less than 2 per cent. of our foodstuffs.

If we could reduce 10 per cent. of our consumption it would be to the advantage of our people; we will have effected all of the ends that we must attain. The problem with us is whether or not we can secure that as a voluntary response in the American people. There is in this question wholly a problem of education. It is our belief that every loyal American wishes to serve the national cause and the national defense and that if it can be brought home to him that his spoonful of sugar and his slice of bread saved is an accomplishment of the national end, we believe that we can attain that, but that it can only be secured if we can secure that every individual in the country is impressed with the fact that it is his or her individual duty. There is a position in which you can be of the most inestimable service to us, if you can carry that message to every household and every person within your acquaintance and throughout the whole of the health associations of the country: that it is a national service, and that it is vital for the continuation of the war, that we cannot maintain our allies constantly in this struggle unless they are to receive this sixty million bushels of grain every month, and that we cannot attain it unless we can reduce the consumption and waste at every kitchen and every table in the United States. We believe that this can be done, but it takes a long time for people to realize its seriousness. It first strikes many people as a curiosity and a matter of general interest, but one in which they are prepared for somebody else to acquiesce. It is with the utmost difficulty that every individual can be impressed with his own responsibility. We have had a great number of exhibits. We have been pleading with the American people to reduce the consumption of sugar for four months, and every month we get the statistics of the sugar distribution of the country and we have found no diminution whatever. The net result of that is that we are practically out of sugar today in several states. I do not look on that as a matter entirely without compensation; it will at least bring a realization to the people of the United States that there is a limited amount of food supply in the world and that, unless they are prepared to join in saving that food supply, they themselves will suffer the direct result of it.

It is absolutely vital to us to continue this export of foodstuffs to our allies. They hold our first line of battle, and if the western line in France breaks down, that line will move to the Atlantic seaboard within thirty days. Therefore we intend to maintain that food supply crossing the seas.

We are told by many economists that the proper conservation of food supplies will be brought about by high prices. I have had myself three years'

experience in that matter, and all actual and practical experience works in the opposite direction. We have no better proof of it than the fact that the consumption of fat in this country has increased about 10 per cent. since the outbreak of the war, and we have had a universal era of high prices. It is, therefore, obvious that the high price itself will not accomplish a reduction in consumption. High prices have a great disadvantage in the fact that they distribute the burden of war unequally on a population, in that the poor, the people with the fixed incomes, suffer for those who reap the values of war commerce.

We cannot allow a continuous rise in price in the country without a continued readjustment of wages, so that we are between two evils; either we must readjust the wage and the earnings and salary of the entire population with the advance in price, or we must check this price raise in order to maintain some economic stability. Therefore, we are interested in conservation from a price point of view, in that if we can secure a reduction in the consumption of foodstuffs in this country over and above our allied needs, we need give no concern to price. If, on the other hand, we are to have a deficiency in foodstuffs, we must take the most vigorous measures, and as such measures will not always be successful in the restraint of price, you can see that conservation becomes to us an economic problem of no mean order.

There is one more phase of this whole problem that I want to put before you, and I will end. (1) We have been forced to this war; (2) war in defense is a necessity; (3) war is a losing business, a financial loss, a material loss, a loss of life and an economic degeneration throughout its entire period. It has but few compensations and of them we must make the most. Its greatest compensation lies in the possibility that we may instil into our people unselfishness, self sacrifice, devotion to national interests. We have gone for a hundred years of unbridled private initiative in this country and it has bred its own evils and one of these evils is the lack of responsibility in the American individual to the people as a whole, the unwillingness of personal selfishness to sacrifice to national interest. We are calling upon many of our people to make the ultimate sacrifice, and it is but little to call on those who remain in comparative comfort that they should make some saving in their kitchens and on their tables. If we can secure that service, we will have instilled in the heart of every man, woman and child in this country the fact that he is doing a national duty and that service carried through the war, the daily feeling that some sacrifice is being made for the nation as a whole, is a compensation in itself.

THE NAVY AND ITS HEALTH PROBLEMS.

SURGEON-GENERAL WILLIAM C. BRAISTED, U. S. N.,
Washington, D. C.

Read before the General Sessions, American Public Health Association, Washington, D. C., October 18, 1917.

THE history of hygiene is one that is replete in military and in civil lines with names of eminent achievement. I wonder if we all fully appreciate, or does familiarity blind us to the fact that we have in our midst and have just been listening to, one whose name will go down in the pages of history as equal, in his benefit to the human race, to the greatest of those who have preceded him. The man who made the Panama Canal possible will never be forgotten by future history.

Gentlemen: Hygiene is of all ages and hygiene is in itself civilization. That which constitutes the gradual and imperceptible advance from a barbaric state to that of our present luxury and safety in our civil life is but hygiene. It has always been a matter of romantic interest to me to watch the gradual development of naval hygiene, impelled by the spurs that have made all progress in hygiene possible, the crowded conditions that have presented themselves in ship life as in civil life. Whether recognized as such or not, naval hygiene has necessarily been a concomitant of the life of all mariners since the first frail barque ventured upon the Mediterranean or skirted the shores of the mysterious and unknown Atlantic. Inconveniences and hardships have been and always will be experienced where men endeavor to live, to work or to fight in the unnatural surroundings of ship life. In the earliest days unconscious efforts in hygiene were directed toward the retention of life, in order to make maritime traffic and warfare possible in these surroundings. Efforts at amelioration of overcrowding aimed no higher.

As far back as the history of the world has been chronicled, the seas have been navigated and nations have bartered and have fought. The Hebrews, Phœnicians, Greeks, Carthaginians, Romans, and Britons have all shared in the development and the mastery of the sea, and by the increasing boldness of their cruising created the major hygienic problems that have confronted us ever since.

The stanchness of construction found necessary to combat the wildness and buffets of the larger seas, the greater storage space for distant cruises, made necessary an increasing number of decks to house personnel and stores. The comparative slowness of naval architecture may be typified by the fact that the *Great Harry*, built in 1545, the pride of the English Navy of that day, was 138 feet long, 36 feet wide, and carried 80 guns; and in vessels materially smaller than this Columbus discovered new continents, DaGama rounded the Cape of Good Hope, and Magellan's ships circum-

navigated the globe. Developments in number, size and armament were rapid thereafter, spurred largely by the spirit of exploration and conquest created by the discovery of new worlds and by the increasing rivalry for the mastery of the seas by the English, Dutch, French and Spanish. The study and application of hygienic principles became a steady problem with the development of larger fleets. In the last 500 years the study of naval hygiene may be considered as the study of hygiene of the British Fleet.

It has not been until the last 100 years that distant fleet cruising has been feasible without terrible loss of life. Epidemic fevers, hunger, and scurvy have demanded toll by thousands. The problems that were met in that day are problems that are met today; improper ventilation, unsatisfactory humidity, poor light, and deficient or defective food and water, all in connection with constant and unavoidable overcrowding. I might almost say that only one problem that has arisen in the hygiene of cruising ships in past history has been satisfactorily solved, that is, the once terrible menace of scurvy. We owe it to James Lind's discoveries and to Sir Gilbert Blane's vigorous enactment thereof that this scourge has been eradicated as a fleet menace. In his Treatise on the Scurvy, Lind said: "In the late war scurvy cut off more valuable lives in our fleet than the united efforts of the French and Spanish arms." Commodore Anson in his famous voyage round the world in the first nine months lost 666 men out of 961.

It was not, however, until the year 1797 that the systematic use of lime-juice was introduced into the British Navy through the importunate solicitation of Sir Gilbert Blane. This fortunate circumstance was brought about in consequence of the alarm created by the prevalence of scurvy in the fleet under the command of Lord Howe in the spring of 1795, the outbreak being traceable to causes highly analagous to those which induced the epidemic on former occasions, namely, the deprivation of fresh vegetables. So prevalent was scurvy in this fleet and so much enfeebled were the crews by its visitation, that the ships were rendered quite inefficient and the safety of the empire became in consequence absolutely imperilled.

The remarkable success, from a hygienic point of view, achieved by Captain Cook in his three year voyage around the world in which with a crew of 118 men he lost only four men, two from drowning, one from a fall, and only one from disease, are attributable to his observance of hygienic common sense and the observation and deductions of James Lind. His measures consisted in providing a dry and well ventilated ship, storing it with good provisions, a supply of lemon juice, and an abundant supply of fresh water, fresh vegetables and fruit at every port when procurable. Great pains were taken to see that the men kept themselves clean, and that the hammocks, bedding and clothes were kept clean and dry.

With scurvy eliminated the chief problem that the mariner of old had to contend with, which is not encoun-

tered at the present time, at least in naval cruising, is that of the moisture and over-humidity encountered in wooden ships, particularly those of many decks. The chief concern of naval hygienists of the last century, and only materially obviated by the use of steel and iron, was that of the constant moisture and over-humidity below decks due to the necessity of cleanliness and the difficulty in reducing the heavy moisture incident thereto. Many conditions which we know from our present knowledge to have been due to extraneous causes, such as the epidemic influences producing yellow fever and typhus, were attributed to the baneful influences of the humidity below decks. Ventilation, other than natural, was procured in those days only by means of windsails; light came from a tallow candle or oil lantern; food for longer voyages was necessarily dried or salted; and water was carried in hogsheads or tanks that were refilled at the various ports of call, even though its source might be doubtful.

In contrast to these conditions, gentlemen, let me outline what may be unfamiliar to many of you, our modern methods of ventilation aboard ship. Artificial ventilation may consist either in supplying a large abundance of fresh air, diluting or driving out the impurities in the living spaces, what we call the supply system, or secondly the method whereby we exhaust from the living spaces the vitiated air. This latter method is rarely used alone but it is used as supplemental to the supply or plenum system.

In the supply system large intakes are situated at such points as will insure the greatest purity of supply with least possibility of contamination. The air is driven by large fans throughout the ship, in branching and diminishing channels similar to the arteries and capillaries of the human circulatory system. The needed supply for the various living spaces varies with the complement living or working therein, and mathematical accuracy is possible in estimating and delivering to the various living spaces the amount of air necessary for the hygienic well-being of their personnel. Living spaces that never see sun or daylight and that are never reached by the natural channels of ventilation are rendered perfectly and hygienically habitable by such methods. There are many such individual systems throughout the ship and compartments vary widely in their demands as regards the character and quantity of air supply. An effort is made as far as possible to include in the ramifications of one trunk line spaces of similar demand. Heat is supplied through the same channels by installing large heating systems called thermo-tanks in these various trunks. A much more beneficial and economical distribution of heat is possible by this method than by that of a number of scattered radiators with their necessarily greater ramification of steam lines.

With a carefully controlled supervision of these various heating units, and by an effort in their installation to secure a uniformity as regards their demand for heat, a remarkably successful combination of ventilation and

heating has been achieved. In contrast to the old problem of excessive humidity and its deleterious effects we have now in consequence of this arrangement very frequently an overdrying of the air, particularly objectionable in its effects upon the mucous membranes of the nose and throat. Various efforts are now being made to overcome these objections, none as yet entirely successful. The method of washing and consequently purifying as well as humidifying the incoming air as practised in our larger hospitals and institutions, is impracticable in ship life for various reasons.

The lighting of the modern battleship presents many more problems than does the similar achievement in the schoolroom or in the factory. That character of lighting most suited to the individual space, either the direct, the indirect or the semi-indirect is utilized, and the character, size and position of the various lighting units are carefully studied. Luckily the powerful heating plant necessary to the maintenance of such a tremendous structure as our modern battleships, provides an abundance of energy for the maintenance of the very extensive lighting system necessary for a structure 1,000 feet long, 7 to 9 decks deep, and housing a personnel of 1,000 to 1,500 men.

The seagoing battleship formerly so subject to scurvy and to hunger owing to deficiency in character or in quantity of the food supply carried, is today no more dependent on outside conditions, or upon the distance of its cruising or the ports visited, for a wide and varied food supply than is the most modern hotel. Large cold-storage plants are maintained where meats, vegetables, and fruits are safely stored and which manufacture daily large quantities of ice. Modern methods of preserving and canning have also been of tremendous benefit.

No longer is the cruising ship dependent upon an uncertain water supply, as all fresh water consumed is distilled from the salt ocean upon which the vessel floats.

Infectious diseases that formerly carried off their thousands, such as yellow fever, typhus, cholera, and typhoid have all yielded to our modern knowledge of their causes and our consequent logical measures taken for their prevention.

How successful the naval hygienists have been in saving life may be indicated by the fact that prior to the introduction of antiscorbutic measures in the British Navy, the death-rate was approximately 120 out of every 1,000, per year. Fifty years later the death-rate in the British Navy was 30 per 1,000 of personnel. Last year in our own service this loss was but 4.48 per 1,000 of personnel. Not only are these figures gratifying by comparison with previous years; but they are doubly gratifying to me in that an analysis of them reveals the fact that a marked factor of safety is apparent in naval life over the figures of the same character of personnel in civil communities. The total death-rate for the registration area of the United States for the census year 1910 was 17.8 per 1,000 of our population. This of course includes all from infancy to old age; but even for

the ages from 20 to 29 years which would approximate fairly closely the average naval age limit the mortality tables give 8 per 1,000 as the incidence of death. This includes both sexes and would be appreciably higher if quoted for males alone.

Thus we have roughly a death-rate of 8 plus per 1,000 and 4.48 per 1,000 as the respective rates for the young men of our country, the larger representing the risk incurred in the ordinary hazards of farm or city life, the latter representing the peace time losses while serving their country, and while under the constant watchful care of the Medical Department of the Service.

But please do not let me seem to convey to you what would be a contradiction of what I have already told you. We have not perfectly ventilated ships, we have not perfectly lighted ships, and we have not perfectly provisioned ships! There is marked room for improvement in all these lines and it is our constant effort and thought to reach higher ideals and efficiency. And complicate all these structural and supply problems with those of the individualities of the 1,000 inhabitants of our berthing and messing spaces, and you will have some idea of the complexity of questions possible.

You know what diseases, what habits, what crotchets of the brain, may be existent in such a gathering, and what measures are necessary to eliminate, correct and counteract these, and to establish a normal living community standard.

The requirements of training make for an ever shifting personnel at sea and again as men complete their period of service — 4, 8, 12 years or more — others come to replace them, recruits fresh from civil life and its varied pursuits. Thus we have a constant flow of influences, that may be good or bad, direct from the communities of many types scattered throughout our broad land. Here is a youth from a town where the inhabitants do not believe in vaccination or where the authorities have not yet risen to the height of enlightenment which dictates chlorination of the lake water they drink though their supply pipes are not 100 feet from the sewer outlet. He is a potential menace to his shipmates unless the government's compulsory protection has been furnished him by the surgeon. Yonder robust youth hails from a rural section where air and sunshine abound but he left at home a younger brother just recovered from cerebro-spinal meningitis. He himself is a "carrier." Beside him with bright eye and ruddy cheek, but drawing swift breaths under the weight of his bag and hammock is a lad that must soon occasion serious thought to the guardian of the ship's health. Leave is requested to go home to see his mother reported dying of "something wrong in her chest." What is to be our attitude to tuberculosis, for instance, and is a hard and fast standard possible by which we may protect our crews from the presence of latent cases? By what criterion are we to recognize the incipient case and secure for him and in the interest of his shipmates the prompt transfer to sanitarium so essential for the good of all concerned?

How shall we clothe these young

men, how many calories must their daily food consumption yield for work and play? How may we adapt the big muscled coal passer, the intelligent looking firemen to the trying conditions in the bunkers and fire rooms down in the bowels of the ship and how shall we protect, increase and prolong their useful activities under conditions so unfavorable to growth and life? The anchor has fouled its chain and behold two divers are preparing to submerge and disentangle it. Skimming along the surface a cable's length from us goes a submarine preliminary to a dive. What of the air and food of the denizens of that bold craft, crowded into a minute space under the menace of chlorine gas arseniuretted hydrogen and carbon dioxide ever threatening.

High above us we hear the soft purring of the seaplane motor. Into a realm new to man are venturing bold and fearless aerial navigators. What of their physical requirements, what of the development of senses heretofore of limited use, what of the effects of atmospheric tenuity on the human organization!

We are living in a great age, throbbing with new and mighty endeavor. A century ago could we have convinced a visitor to this city that cars would run over a route propelled by unseen force of electricity, guided by a wire? Would we have believed it possible that you and I could talk to a friend in Chicago or to the captain on the deck of a war ship at sea? Would he be astounded with the thought that Jules Verne's dream of submarine navigation had come true? Would he be amazed in realizing that today air ships are gliding aloft, going hither and thither in the aerial ocean, offering all in one, the possibilities of travel over land and over water.

Gentlemen, past history and even more so present history have revealed the meaning of the navy in Great Britain's national life. The watery isolation of that wonderful island empire from its past, present or future antagonists of the old world is entirely analagous, only on what is and will be a stupendously more magnificent scale, to the situation of our own country and continent. What the future must inevitably hold, if armaments continue, for this great colossus of a nation, is that of the dominating naval power of the world. No spirit of aggression will prompt it but a spirit of defense will demand it.

And in the conservation of the health and wellbeing of its personnel, without which its crowded battleship would be but as Goliath before David, I pledge myself, my present colleagues of the Medical Corps of the Navy, and those who will shoulder our burdens when we are gone, in life and in death, to the preservation and the perpetuation of the glory of our country and our flag.

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THE RECENT MEETING OF THE ASSOCIATION AT WASHINGTON.

The forty-fifth annual meeting of the American Public Health Association was the most successful meeting in its history. So great was the response from all sections of the country that attendance estimates were exceeded, and at a number of the general sessions the halls were crowded, so that many were compelled to stand.

The members were in Washington for work and they stuck to their tasks. The local committee had been requested to provide no entertainment but this request was disregarded to the extent that there was a general reception in the New National Museum at which the Marine Band rendered music. The time of the visiting ladies was occupied by teas, receptions and automobile rides.

The central theme of the meeting was the health of the first line of defense—the military forces. Surgeon-General Gorgas, Admiral Braisted and other speakers told of the plans for maintaining the health and efficiency of the troops in training and in the field. Drs. Trask and Frost told of the plans of the Public Health Service and the American Red Cross to protect the military by making their surroundings healthful. Drs. Goodwin, Rist and McCullough gave the experiences of the English, French and Canadian armies. President W. A. Evans presented a review of the present status of communicable diseases, with especial reference to war problems. A multitude of speakers presented the problems of the civil health officer, especially those in direct, and somewhat indirect relation to the health of the military.

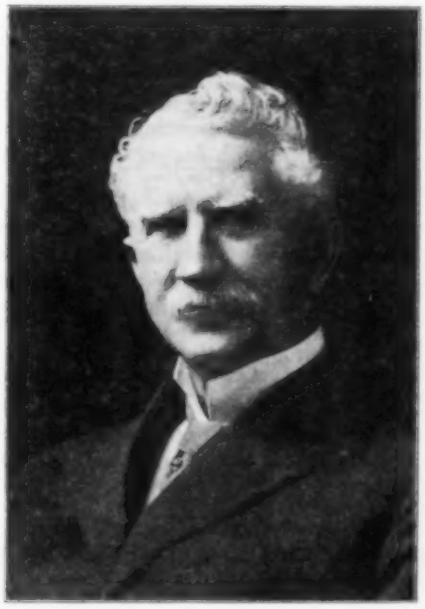
Surely the problems of military hygiene in relation to the environments of military establishments are less difficult by reason of the deliberations of this meeting. We should begin to head toward another great meeting at which attention should be focussed on the health of those who constitute the second line of defense—the general population.

It was proper that this meeting should have limited its thought largely to the military and those who immediately serve them; for examples, the workers

in munitions industries and the citizens of nearby cities. But this duty having been discharged, let us remember that the backbone of a successful twentieth century war is the welfare of the general population. Irving Fisher is credited with saying that we will not know who has won this war until thirty years from now; not until such time as it has been possible to valuate the human wastage among soldiers, workers, children, the unborn—the racial stock generally. War places an increased strain upon those out of the ranks as well as those in them. At the same time the sources of strength to withstand this strain are apt to be lessened—less food, less play, less medical service. Such subjects can well occupy our thoughts in the wake of this most enthusiastic and helpful meeting.

It would be wrong not to allude to the impression made by the address of Mr. Hoover. Those not in attendance can read what he said but they cannot have the effect produced by his quiet, reserved, forceful presentation.

DR. W. A. EVANS
The Retiring President



DR. CHAS. J. HASTINGS
The New President

THE OFFICERS FOR THE COMING YEAR.

The following officers were elected at Washington for the next year: President, Dr. Charles J. Hastings; Vice-presidents, Dr. George M. Kober, Dr. Manuel Iglesias, and Dr. Guilford Sumner; Treasurer, Dr. Lee K. Frankel; Secretary, Mr. A. W. Hedrich.

The new president, Dr. C. J. Hastings, has made a reputation as health commissioner of Toronto. We have a right to expect that his administration will be active, vigorous and forceful. When the information came that Professor Gunn would be abroad for another year engaged in tuberculosis work in France, the

members voted hearty resolutions of appreciation to our secretary and elected, as his successor, Mr. A. W. Hedrich, who, upon the recommendation of Professor Gunn, had been acting secretary during the unexpired term of Professor Gunn.

The highest praise was extended to the retiring president, Dr. Evans, for his courageous and efficient service. Universal regret was expressed that he was not free to accept another term, which had practically been offered through renomination by the Advisory Council. However, his election to the Executive Committee, together with Drs. Hurty, Bryce and Sumner, and the customary officers, will ensure continuity to the comprehensive plans for expansion of the Association, as presented before the Board of Directors.

The place of the next meeting was not designated, this being left to the Executive Committee to decide, in accordance with the exigencies of the war.

PROPER PAY FOR HEALTH OFFICERS.

Aberdeen, S. D., a city of 15,000, offers a salary of $2,000 for a medical health officer.

The announcement is encouraging. In the first place, we have a city of only 15,000 population departing from the custom of rewarding a war veteran—either military or political—with the local health office. Second, the salary is higher—not much higher 'tis true, but higher, nevertheless—than that which might be paid to the city hall janitor or the local dog-catcher.

Aberdeen may not be able to employ a physician properly trained in public health for $2,000. She will do well to eliminate the medical requirement, thereby opening the doors to a large number of well-trained sanitarians, well qualified to do the work, but without the medical degree. California recently set an example by employing three non-medical sanitarians out of a total of six employed as district health officers. That, however, is beside the point. What we wish to emphasize is that if larger cities appropriate on the same per capita basis as Aberdeen, a city of 30,000 will pay the health officer $4,000 per year.

As was emphasized by President Evans at Washington, the time has come for the Association to attack the salary question in an organized way. Speed the day when communities realize that public health is public wealth, and become willing to make an investment in the form of a reasonable salary for the health officer.

RED CROSS RELIEF INSTEAD OF CHRISTMAS CARDS.

A letter from a large cement manufacturing company in Chicago reads as follows:

"A number of companies in Chicago, whose custom it has been to distribute engraved Christmas and New Year cards, have decided not to do so this year, but instead to contribute the money to the Red Cross or other relief organizations where it will do real service.

"There is no reason why the movement should be confined to these lines or, indeed, to the City of Chicago. Many corporations and thousands of individuals throughout the country are now planning their form of greeting, and if the matter is presented to them in the right way by a country-wide publicity campaign hundreds of thousands of dollars can be diverted into relief channels where so much money is needed at this time.

"Another thing, the supply of labor in all parts of the country is wholly inadequate for necessary, important and productive enterprises. The successful outcome of this movement would release labor from non-productive and consuming enterprises which would be diverted into productive lines."

The idea is sound, and is commended to our readers.

HEALTH PROBLEMS OF THE ARMY.

SURGEON GENERAL WILLIAM C. GORGAS, U. S. A.,
Washington, D. C.

ONE would naturally surmise that, with the advent of war, the question of public health assumed lessened proportions in the mind of the military sanitarian. The problems incident to the care of the large number of sick and wounded soldiers would seem to be of sufficient magnitude to crowd out of military consciousness and relegate to a subsidiary position the management of the details of public health.

Such a supposition is totally fallacious. Indeed, in time of war the public health problem assumes even larger importance than it possesses in times of peace. With a small army (and in my early army-life days it was notably smaller than in more recent years) in times of peace the health of the civil community has an important bearing on the health of the garrison,—an importance that the sanitarian never loses sight of. However, in times of peace, the army medical officer always realizes the saving grace of being able to withdraw from a locality where health conditions assume threatening proportions. This procedure, a sanitary measure practiced in my early days, was always impressed upon the military surgeon, and particularly in regard to yellow fever.

Yellow fever was the disease most feared by our army stationed along our southern border; but we always realized that if the disease appeared in sufficiently grave form we would march away. Frequently, as sanitary adviser of a command, I have recommended this measure; for it was a well-recognized phenomenon of yellow fever infection that a command could strike tents, march a mile away from the infected site and pitch tents again in safety. After this maneuver, new cases would not appear for sometime, even though previously the disease may have been widely distributed. Often, if the command remained long enough, the disease would reappear, but in such an event it was fairly easy to beat another retreat.

For infectious and contagious disease, other than yellow fever, such methods were not resorted to, although, as may be readily seen, it was feasible to do so. The important point is this: we were moving away from the source of infection; and the source of infection was the immediately surrounding community. The ability of military commands—I am referring now to peace conditions in which, necessarily, our army meant small bodies of men—the ability of military command to remain under very adverse climatic conditions in perfect health as long as the community around them was in good health, can be illustrated by numerous ex-

amples. One instance has always impressed me very strongly because it bore association with the history of yellow fever. It was the expedition of Drake to Panama. Drake came to Panama in the latter part of the sixteenth century with a small command of about 100 men in three small vessels and hid himself on the coast of Panama. The northern coast is something like our Florida coast, covered by a succession of islands, which leaves a wide bay with many indentations behind the islands and the mainland. Now this region of Panama afterwards came to be looked upon as the most deadly part of the world. At the time I speak of, it apparently had not been infected; the natives were perfectly healthy. Drake and his men remained here for over a year without any particular sickness, making forays into the regions occupied by the Spaniards. After being there about a year, they went down to Cartagena, captured the city, remained there for two or three or four weeks plundering, then coming back with their booty to their little cove. Within four or five days after getting back, they began to sicken and, in the course of two or three weeks, one half of the command died. The epidemic then subsided and disappeared and the men that were left remained healthy until they left Panama. Evidently the disease that affected them was yellow fever, with which they became infected and carried back to Cartagena. The significant fact is that they could remain in this country which was afterwards looked upon as so deadly, for over a year, without a single death. The perfectly evident reason is that they were living in a country where the natives were entirely healthy; they then left, went to an infected point, came back and lost half their command. They still, for some reason, did not infect the community around them. The disease disappeared and they remained healthy for another year in this same locality.

How different the story of the sanitarian's activity in war times! How much more important becomes the question of the health of the community!

Our danger originally lay in bringing the troops into camp and introducing infection with them. Happily, the men have been encamped without any particular mishap. Now our problem is the prevention of introduction of infection from without. You will appreciate, therefore, how exceedingly important is the health of the civil population of the whole country, in relation to a military force, such as ours, numbering a million and a half men, engaged in training in various centers over the country. These men are in a perfectly satisfactory condition at present, as far as infectious and contagious disease are concerned. If we were in desert Panama, with no civil population around us, we should have no concern or anxiety with regard to maintaining this status of good health. Our problem now assumes the definite form of maintaining a low percentage of morbidity in a civil population, from whom by the very exigencies of the situation, we cannot march away.

Our danger will be from the same source when we go to Europe. We will

probably have no particular difficulty in keeping the men free from infection as far as the camps themselves are concerned, if we do not get the various infectious and epidemic diseases from the population around us. It is, therefore, quite evident that the work and influence of an association such as this is more important to the military establishment in time of war, at this present time, than it is to us in time of peace. I, therefore, as the surgeon general of the Army, hope that this body will keep up the same effective work during the war that they have ever since I have been a member, and for years before, in times of peace. I wish to express my thanks to the Association for the part that they have already taken, and also my gratitude. You remember the definition of gratitude: a lively appreciation of favors expected (laughter). I express my gratitude to the Association in that sense, a lively appreciation of the assistance we expect to get in the next two or three years. I do not mean to predict that the war is going to last that long but, if it should be needed, for two or three years. I'd rather not make any prediction on that subject at all.

Wartime Tuberculosis Plans.—The *Journal of the Outdoor Life* for September, 1917, contains several interesting pages of notes and gleanings concerning tuberculosis prevention measures which are planned to prevent further dissemination of this scourge because of the war.

Surgeon General Gorgas has established a department or bureau for tuberculosis with Col. George M. Bushnell in charge. Colonel Bushnell is one of the leading tuberculosis pioneers in this country; and he is organizing a corps of tuberculosis experts who are working in every army camp. All members of the National Guard and of the New Army will be given an examination by one of these experts and the discovery of active tuberculosis will bar a man from becoming a soldier. The National Association for the Study and Prevention of Tuberculosis has seized the opportunity afforded by the war for the furtherance of its splendid work. The association program consists of two general lines of work: First, a study of the situation in all of the army and navy camps with a view to organizing preventive work in each to be carried on by state and local tuberculosis agencies; and, second, in an endeavor to secure, so far as is possible, lists of men rejected from recruiting stations, camps, and the regular army on account of tuberculosis, and to arrange for adequate care of these men in their home communities.

In each state and in large cities and counties, war tuberculosis campaign funds are to be created, to be spent along the lines of education and organization, with a view to increase the city, county and state facilities for the care of tuberculosis.

Illinois, Wisconsin, and New York are among the states that have worked out and put into operation more or less complete programs for the control of tuberculosis based upon the necessities of war. Special educational measures are being employed in Illinois and Wisconsin; while in New York, twenty new county hospitals will be provided.

The National Association plans to give Tuberculosis Week for December 2 to 9 a decided war tinge.

PRESERVATION OF THE HEALTH OF THE SOLDIER ON THE WESTERN FRONT.

COL. T. H. GOODWIN, C. M. G., D. S. O., R. A. M. C.
Office of the Surgeon General, Washington, D. C.

Read before the General Sessions, American Public Health Association, Washington, D. C., October 19, 1917, for Col. Goodwin by Capt. J. Gilmour, M. C., R. A. M. C.

FROM the point of view of the commander of an army, the importance of the preservation of the soldiers' health can hardly be overestimated.

The fundamental duty of the Army Medical Service is to insure by every means in its power, that the requisite number of men in good physical condition are provided for the fighting line, that these men are kept in good health and that, if sick or wounded, they are restored to good condition and returned to the firing line as soon as they are fit for duty.

This being so it may readily be understood how important a part hygiene and sanitation play in the efficiency and fighting value of our army.

Prevention of disease in field armies has made enormous strides during the last fifteen years.

In previous wars our losses from preventable sickness have far exceeded our losses from battle casualties. During the present campaign this ratio has been very markedly reversed and the health of our army on the western front has, I am glad to say, been uniformly excellent, the loss from preventable disease having been reduced to a minimum.

Sanitation in the British Army is not a matter which is left to be dealt with solely and entirely by the medical officer, our regulations say that the officer commanding any unit, *e. g.*, the colonel of a battalion, is himself personally responsible for the sanitation of the area which his unit is occupying and that he will be held personally responsible that every individual under his command carries out all sanitary orders and regulations.

This is a very important ruling, and nowadays every combatant officer fully recognizes the value and importance of good sanitation and hygiene, and does all in his power to insure that recommendations made by the medical branch are carried out to the letter. He recognizes that, if this is not done, the efficiency of his unit as a part of the fighting machine, will diminish.

The chief diseases which affect our soldiery in the field, and against which we constantly have to be on our guard, are typhoid and paratyphoid fevers, dysentery, and cerebrospinal meningitis.

These diseases are all preventable but prevention cannot be efficiently carried out by merely issuing orders and making routine inspections. Every medical officer must be constantly and without relaxation on the

watch for the earliest signs of occurrence of any of these diseases and must most carefully guard against any untoward conditions arising which might favor their incidence.

It is not possible, in the time at my disposal, to do more than briefly outline the measures for dealing with these diseases.

There are, as pointed out by Major Lelean, two essential methods for obtaining the information on which the necessity for action must be based.

(1) Accurate diagnosis:

This is not always an easy matter on active service, but has been greatly facilitated by the provision, in our armies, of travelling motor laboratories with full equipment for laboratory work. By means of this work the detection of 'carriers' (a matter to which I shall refer later), and the systematic examination of excreta in cases of diarrhœa, have borne excellent results.

(2) Accurate statistical record of the prevalence of preventable diseases.

Preventive Measures.

Constant unremitting attention must be the watchword of every officer in medical charge of troops or in command of units.

The potentialities of human "carriers" must never be lost sight of, the presence of such in a unit must be constantly watched for, as it is by their early detection that outbreaks of disease can be prevented or checked at the very outset.

As regards typhoid and paratyphoid fevers we may divide carriers into two classes:

(1) The "post-enteric" *i. e.*, the cases which have suffered from an attack of the disease. It is estimated that about two per cent. of these remain "carriers" for an average period of four years after they have recovered from the attack.

The organisms live in necrotic patches in the mucosa of the gall bladder. In this situation the organisms are protected both by the avascularity of the necrotic patches and the consequent inability of access by the antibodies in the blood, and also by the fact that the bile salts neutralize certain of the antibodies.

In the gall bladder the organisms live and multiply undetected, possibly for long periods, until a chance attack of diarrhœa with biliary discharge sweeps them into the intestines, and infective excreta result.

(2) The "contact carriers," persons who are in apparent perfect health and with no previous history of the disease.

Major Lelean points out that these may be liable to auto-infection from their own foci.

The importance of the infectivity of the hands of "carriers" must not be lost sight of. A very interesting case was that of a fo'c'sle hand who infected thirteen men through their handling the rungs of the ladder in reaching their quarters.

The following experiment was carried out in one of our enteric depots in India. A "carrier" was, without previous warning, made to stroke with his finger the surface of a culture plate. Five colonies of pure enteric organisms resulted.

Difficulties in Detection of "Carriers."

These are considerable. The odds against the discovery of bacillus typhosus in any single examination of the excreta are very considerable. From what I have said above, however, it may readily be inferred how important it is that those who are concerned with the preparation and handling of food or water should have their previous medical histories carefully inquired into and that such persons should be kept under constant observation. The occurrence of cases of diarrhœa in any unit should be immediately carefully investigated and the excreta of suspicious cases sent to the laboratory for examination. The above remarks have been made more especially with regard to typhoid and paratyphoid fevers, but the broad principles are equally applicable, to dysentery, cholera and diphtheria.

As regards cerebro-spinal meningitis, I should like to add a few remarks.

On the occurrence of a suspicious case, the patient must be at once isolated and placed under treatment.

His clothing, bedding and quarters must be disinfected.

All "contacts" must be segregated in well-ventilated quarters.

Swabs from the naso-pharynx should be taken—by means of a covered swab carrier such as West's—in the case of each "contact" and sent to the mobile bacteriological laboratory for examination.

Pending the result of such examination the men should be treated by nasal insufflation and gargles twice daily.

Those in whom the results are negative, and whose throats are normal, may return to duty. Any who are reported as "carriers" should be transferred for treatment and isolated until two successive swabs taken from the naso-pharynx, at intervals of several days, are reported as negative.

Sanitation in the Forward Area.

The sanitary organizaton of units in the field is as follows:

A small detachment of Royal Army Medical Corps men is attached for "water duty" to each combatant unit in the field.

In addition to these every unit furnishes, from its ranks, a "sanitary detachment" consisting, in the case of an infantry battalion, of one non-commissioned officer and eight men. Both the "water duty" men and the "sanitary detachment" are at the disposal of the regimental medical officer and work under his command and direction. The supervision of sanitation of the unit of which he is in medical charge forms an extremely important part of the duties of every regimental medical officer.

Sanitary principles, methods and details have been very fully described in various text-books on the subject and I shall not attempt to do more than very briefly outline them.

(1) Food is brought as far forward as possible by motor or horse transport, and then distributed by hand carriage to the various regimental headquarters where it is cooked in dug-out kitchens and thence carried by hand, in jacketed hot-boxes, to the front line trenches.

(2) Water, purified by the addition

of chloride of lime, is similarly distributed, being carried to the trenches in empty petrol tins.

(3) *Conservancy.* The removal system is now practised in all trenches, the latrine buckets being carried back nightly and the contents buried in excreta pits.

Kitchen refuse is incinerated.

Flies constitute a pest which requires unremitting attention in order to prevent their gaining the upper hand.

Lice carry the virus of typhus fever, relapsing fever and most probably the so-called "trench fever."

This pest is dealt with by means of careful attention to personal cleanliness.

Infestation may largely be prevented by the use of powders such as "N.C.I." powder, naphthaline 96 per cent., creosote 2 per cent., and iodoform 2 per cent., and ointments such as "vermijelli" or crude oil ointment; the latter is the more effectual and consists of a mixture of two pounds of soft paraffin and four ounces of crude tar oil melted together.

The institution of divisional baths, which are worked in coöperation with arrangements for disinfection of clothing, has proved of untold benefit.

Each of these baths is capable of dealing with from 1,000 to 3,000 men daily.

Now gentlemen, from the above brief outlines, you may judge as to the magnitude and importance of sanitation as regards an army on active service. The more highly civilized a nation is, the more perfect its arrangements as regards water supplies and refuse, supervision of food supplies for the public, etc., the less equipped, as regards sanitary knowledge, will the population of that nation be should the country be suddenly plunged into war.

In peace time, and without prospect of war, all sanitary measures and problems have been ably dealt with by municipal and other authorities and the ordinary "man in the street" knows little or nothing of sanitation and its importance. This is the very man, who, after a comparatively brief training, is put into the fighting ranks of the army, and naturally, he, from his absence of previous training and knowledge, is handicapped, and unwittingly constitutes a serious menace to the health of the unit of which he forms a part. This applies also—though of course to a vastly less extent—to the doctors in civil life, who, on the outbreak of war, come into the army as medical officers.

They have, naturally, much to learn, and I think that there can be no greater tribute to the efficiency of general medical education and training than the able manner in which young medical men, with comparatively little special training, grapple with the complex problems of army sanitation.

Would it not be advisable for education in public health work and in military hygiene and sanitation to form a compulsory part of the curriculum of every medical student? Recent experience has shown us how important such knowledge is and how unexpectedly and suddenly the necessity for it may be felt.

SEWAGE DISPOSAL PROBLEMS OF A COAST SUMMER RESORT.

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Read before the Public Health Administration and Sanitary Engineering Sections, American Public Health Association, Rochester, N. Y., September 7, 1915.

HUMAN nature is naturally conservative. So it is that the work of the modern sanitarian is often called into question, because of the fact that our fathers lived to ripe old ages without even the knowledge—to say nothing of the practise—of sanitary science. Thus when it becomes necessary for the carefully guarded water supply system to supplant the time-honored family well, and this in turn necessitates some system of water purification, the conservative element at once says, "Give him an inch and he'll take a yard." How little is it appreciated that it is the taking of this extra distance which spells progress—that new conditions are continually being created, which in turn demand new solutions.

In the same way, changed sewage conditions result from the installation of the public water supply. The per capita water consumption is increased, and consequently there is a corresponding increase in the volume of sewage. Cesspools become much more numerous, and tend to supplant the earth closet and the privy. The polluting contents are then liquid as compared with the former semi-dry matter. Because of the danger from overflowing and the fact that the construction of the cesspool may affect the few surviving wells, there is more or less of a constant menace. The next logical step after the introduction of the water supply is the building of a public system of sewage collection and disposal. In fact the two systems should be planned at the same time.

The summer resort offers a very difficult problem from the sanitary standpoint. Most of these resorts have gone through an evolutionary process. Usually they have had their beginnings as rough camps or as farm boarding houses, supplied with only such primitive sanitary conveniences as a sparsely populated country would require. Because of unusual location or remarkable climate, a rapid growth in population may have been experienced. With that growth, however, there is seldom a corresponding development in things sanitary. Consequently in many of our summer resorts there is found city crowding with extremely poor methods of camp sanitation.

In addition to this, another complexity is added to the problem in the character of the summer population.

Coming from all parts of the country and with the possibility of bringing any or all of the various intestinal diseases with them, the summer visitors very often accept conditions which they would not abide in their winter homes. Possibly this last-mentioned fact may be due to the short stay of the summer resident or to the fact that in many instances he does not own the cottage or camp in which he sojourns. At all events the question of sewage disposal is given little consideration. So long as the odors are not offensive, and so long as his neighbors do not complain to the health department, matters are allowed to slide. These are curious facts, when one takes into account the facts that people usually go to the summer resort for healthful conditions, and that the price paid for the summer home is extremely high. In an effort to get "good air," the summer visitor loses sight of the facts that the summer months offer ways and means for the spread of intestinal diseases, which are not experienced during the winter months. Yet no extra precautions are taken.

Because of the nature of the place, the coast summer resort often offers very difficult problems either in the construction or in the operation of any system of sewerage. The scanty soil, the rugged shore line and the great abundance of ledge rock make construction most difficult. The contour of the land with its high elevations and long stretches of land below sea level make the planning of the system work for an expert. Where no public system of sewage collection and disposal is attempted, the construction and operation of cesspools and other sanitary devises may be quite difficult. Abundance of rock and scantiness of soil for seepage are the two trying features. Where the summer home is near the ocean, a private sewer is the usual means for disposing of the sewage matter. Owing to cost of construction, this sewer is laid on the top of the rocks. Not only are such unsightly, but they are always subject to being washed ashore in time of storm. At such times the sewage will be discharged above the high water mark and a nuisance is almost sure to result. Again, in the parts of the resort which are below sea level, there is not sufficient pitch to discharge the sewage into the sea and there is usually too much water in the soil to make the construction of a cesspool practical. In such places privies of the pail type or dry closets must be relied upon. Although these are usually built high above the ground, yet in the rainy seasons the high water floods them and carries the fecal matter into neighboring yards. During the past summer all of the cesspools and privies in a part of one town were flooded. While no sickness was traced to this source, yet after the draining off of the water most disagreeable odors resulted. With our popular beliefs as to the origin of typhoid, many were practically sick from fear of contracting the disease from the offensive odors.

The installation of private and public sewers, as well as of cesspools and privies, should always have in mind the danger of beach pollution. The beaches are one of the chief attractions

and business assets of the shore summer resort. Everything should be done to keep them clean. Occasionally sewers are so poorly planned and constructed that fecal matter may be found on the bathing beach. This does not add greatly to the attractiveness of the bathing, even if it does not constitute a serious menace to the health of the individual.

In parts of the town where public sewers have been built, difficulty of operation may be experienced because of stupidity on the part of engineers in locating the same. Owing to the continual shifting of the sand, trouble usually results from sewers along a sandy beach. So long as the pressure of the outflowing sewage is sufficient, the sand is continually washed out, but as soon as the incoming tide exerts greater pressure, the sand is carried in and deposited in the pipe with the result that the outfall becomes choked. A makeshift is sometimes used to prevent this. It consists of a stream of water, which is constantly forced through the pipes. Besides being uncertain, there is a great loss of water. In case the sewer outfall becomes plugged, a length of pipe near the low water line must be taken up. The blocked pipe is opened by introducing a stream of water through an iron pipe. This can only be done at the lowest runs of tide and at each low tide work can be done for only an hour, so that the task of clearing the pipe is not an easy one. Owing to the great distance over which the sand extends, sewer outfalls in this region are not very practicable.

The difficulty of obtaining satisfactory sewage disposal is not confined to the parts of the resort situated along the shore. The outlying parts of the town encounter ledge rock, which not only makes construction of cesspools difficult but makes cleaning necessarily frequent. The usual result is that an overflow or a direct pipe is turned into a nearby stream of water, usually a brook, converting it into an open sewer. Soon the brook becomes clogged with a rank sewage growth, and the water drains off very slowly. From such places there develope during the summer months rank odors and an abundance of mosquitoes. Cesspools in ledge rock also offer a serious menace to the few surviving wells in the neighborhood. In one instance a new cesspool, fully a quarter of a mile away from a well, was found to be on the same seam of rock. As soon as sewage was deposited in the cesspool the same began to appear in the well water. Fortunately the discovery was made by analysis before any harm resulted.

Where houses are located on a river, the sewage is discharged into it. In coast resorts the river may empty into a small harbor, where space may be used by the fish-markets for floating fish and lobsters. Into this harbor many sewer pipes from cottages may drain direct. In this way the various sea foods may receive a continuous supply of fresh sewage. While recent experimental evidence may seem to indicate that the danger from this source is not very serious, yet the suggestive element still remains, and is of enough importance to warrant a change. Furthermore, ow-

ing to the fact that the grease in the sewage coagulates when it comes in contact with the cold water, the sewer pipes little by little become clogged. Finally there comes a great hue and cry from the summer tenants and after much effort the pipes are cleared and sewage matter is washed ashore for a few days.

Such are some of the problems of sewage disposal in coast resorts where no adequate system of sewage collection and disposal has been installed. Because each household must bear the expense of caring for his own cesspool, the same is usually neglected until a nuisance results. Cleaning cesspools is not an attractive occupation and demands extra compensation. The extra expense often influences people to allow them to go uncleaned. In a small community, where part of the houses empty overboard, there is usually not enough work to require the full time of a single individual. One of two conditions ordinarily results. Anybody takes a chance at the job and the sewage matter is spilled from one end of the town to the other, or one individual equips for the work, is licensed and receives a fixed compensation for the supervised work. Needless to say, the latter way is by far the better, but too often householders expect the work to be done for practically nothing. The end result of the cesspool system is that the health department has several hundred small systems of sewerage to look after instead of one. Cesspools in series, septic tanks, privies and individual sewers are at best make-shifts and almost always produce beach pollution.

The one solution of the problem, as experience shows us, is the construction of a complete system of sanitary sewers. This should not be undertaken until a very careful study has been made of local conditions. Too often town fathers have been persuaded by a "good practical man" to build a small stretch of sewer, which later has to be abandoned because of failure to take into account local conditions, growth of population or other parts of the town. The coast resort problem requires the best sanitary engineering skill available. The drainage areas must be carefully determined, so that excessive expense of construction may be avoided. Some of the land will be found below sea level, which will necessitate the installation of some sort of an automatic pumping system. The location of the various outfalls must be worked out so that there will not be even a suggestion of beach pollution. These outfalls should be out of sight. This may require an additional outlay in going through rock. Finally, during the summer months no raw sewage should be emptied along the shore. This necessitates some system of purification. The two most practical methods, which suggest themselves, are screening (or sedimentation) with disinfecting, and intermittent sand filters. In either case the measures of purification need be carried on only during the summer months, when the beaches are being used. During the remainder of the year the volume of sewage is comparatively small and may be bipassed without any nuisance resulting. In all of this work too

much emphasis cannot be laid upon the necessity of obtaining trained men to undertake the work. All along our shores there are a good many monuments to the false economy of doing the work half way, resulting in badly polluted beaches, continual outlay of money, and dissatisfied people.

One reason why fewer communities take up this work is because of the large initial outlay of money which is usually necessary. Financial schemes have been devised whereby the expense of construction may be borne not only by the present generation, but also by generations to come. This is quite proper, for a properly installed system of sewerage will render service for many generations.

Where a single system of sanitary sewers is not able to be obtained for some time to come, the next best is a careful supervision of the other sanitary devises. Large cesspools in series have been found quite practical. By the use of the syphon only the liquid matter is carried over into the overflow cesspools, thus keeping all of the solid matter in the receiving cesspool and permitting larger seepage area in the overflows. The receiving cesspool will in most cases require cleaning but once a year. Septic tanks have in a few cases given satisfaction.

From what has been shown, the sewage problem of the coast summer resort is clearly a difficult one. Complexity is added because of the cosmopolitan population, the short stay of the same, the rapid growth of the summer colony and the difficult natural features encountered. However, every summer resort should appreciate the fact that excellent sewage disposal equipment is one of the first assets, which it should strive to attain. The day will come, and is not very far off, when the summer resort with overflowing cesspools, poorly kept privies or unsightly and ill-smelling sewer pipes will be looked upon as a poor place for health and recreation. On the other hand, the resort with a complete system of sewerage, which not only provides for the collection of the sewage, but during the summer months provides as well for the purification of the same, will receive the patronage of thoughtful and educated people.

A Score Card for Barber Shops.—Score cards for showing conditions at dairies and markets have long been familiar to sanitarians, but a barber shop score card is somewhat of a novelty. Believing, however, that these shops are of sufficient importance to warrant occasional inspection, Health Officer James A. Tobey of West Orange, N. J., has devised such a card. It is divided into two parts, "equipment" allotted 40, and "methods" allotted 60 out of 100. In an endeavor to concentrate on important points, there are only fourteen items, the principal stress being laid upon sterilization of all utensils after each use, washing of hands before attending customers, clean individual towels, and employees who are clean and free from disease. The card seems to have had a beneficial educational effect and inspires a sense of rivalry. Shops have usually scored high on equipment and low on methods, but a change for the better according to the standards of the card seems to be on the way.—*Submitted by James A. Tobey, Health Officer, West Orange, N. J.*

THE HOSPITAL AND INDUSTRIAL HYGIENE.

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THE first relation of the hospital to industrial hygiene is in the obligation of the hospital to provide for the study of industrial disease. This obligation is the more imperative because of the prevalent ignorance among physicians of the hazards of various occupations and trade processes and of the ill health dependent upon such hazards. The failure of American industry to develop adequate standards of industrial hygiene has been due in great measure to the medical profession's almost complete neglect, until very recent years, of the problems of industrial medicine. It is obvious that no sound and rational hygienic measures can be instituted in industry unless they be warranted by honest and scientific observations upon the effect on workers of occupational health hazards. Studies of this nature have been made in but few industries and by few persons. We can, indeed, borrow from the experience of other nations, notably England and Germany, but there are many problems peculiarly our own, and any problem in its local setting becomes a new problem. The distinctive characters of the hazards of American industry are dependent in part, of course, upon a difference in manufacturing methods and processes, but even more upon differences in wage scales, standards of living and the economic and social conditions related to industry and industrial community life. Because of the hospital's exceptional opportunity to observe the effects of hazardous trades upon the working men and women coming to its clinics and wards, the hospital can contribute much toward a true conception of industrial disease, and in so doing does it establish its most vital and essential relation to industrial hygiene.

The cause of sickness among workers is rarely to be determined by such a simple investigative measure as factory inspection, and it is becoming more and more apparent that industrial hazards are for the most part rather ill defined etiological agents in disease, and that industrial disease must be studied by the same methods of scientific medicine which are applied to the diseases of persons out of industry, with the same painstaking care, but with an even wider knowledge of possible causative factors and an even deeper delving into collateral economic and social relations. In a study of the causes of debilitating disease among garment workers, for example, it is fully as important that due emphasis be placed upon an investigation of living conditions, individual and family income, nutrition and personal hygiene, as upon consideration of shop ventilation, faulty posture, or noxious fumes from gas irons. The problem of pulmonary

disease among textile workers is but a part of the problem of pulmonary disease in the homes of persons who happen to be operatives in textile mills.

There are few medical conditions which, in their study, do not warrant consideration of possible industrial aspects. It is as important to know under what strain the "compensation" of a case of heart disease was broken as to know the cause of the original damage to the heart. Most surgeons can unhappily recollect certain appendectomies or operations for intestinal obstruction strangely associated with sundry lead hazards discovered after operation. Pediatrics is possibly the only special field of medicine which is not frequently concerned with phases of industry, and it, indeed, is not wholly unconcerned because of the visitation of misfortune upon the children of many of those who labor under unhealthful industrial conditions. The fundamental medical sciences, as physiology, pathology, and biological chemistry, are as definitely involved in the study of industrial disease as are the branches of clinical medicine, but all of these must be supplemented by a third critically important element, namely, knowledge of actual working conditions and of the hazards of specific industries and trade processes. The importance of special, first-hand knowledge of industrial conditions cannot be too strongly emphasized, for without it important evidence is frequently overlooked or wholly misinterpreted, and the lack of such knowledge has been responsible for much of the almost worthless work, published and unpublished, upon problems of industrial hygiene. In many cases social investigation will be found very necessary, and it always offers a valuable check upon other findings. This is especially true in regard to tuberculosis and in the large group of cases presenting evidence of nerve strain and those of debility of uncertain origin.

There are several reasons why the hospital is peculiarly able to contribute to the new knowledge of industrial disease. While that which is to follow is applicable in some degree to almost any hospital, it applies particularly to the larger hospitals in industrial centers and to institutions embracing outpatient clinics.

Obviously the equipment of a large hospital, with its specialized staff, its various laboratories and resources, renders possible research in industrial disease at a cost which is but a small fraction of that required for the maintenance of a special, independent institution such as has been established. The adult patients coming to general hospitals are for the most part men and women in industry, and the very volume of attendance alone offers much valuable evidence in the study of the diseases of occupation.

While it is true that in health surveys of industrial plants, if incidental medical examinations be made, there may be revealed cases of industrial diseases, especially in its incipiency; it is also generally recognized by those who have attempted such investigations that the reserve of most workmen regarding their subjective symptoms is for various reasons rarely to be

broken, and in consequence satisfactory, accurate data are seldom and only with difficulty to be obtained. Men usually "move on" from a factory or a process which they suspect or know to be, for them, a dangerous one, and into a presumably safer field of endeavor. In such a case the plant survey misses a valuable index to a disease-producing hazard. It is, however, just such cases which come in great numbers to hospital dispensaries and into the hospital wards, those "down and out" as well as those just starting down. If in the hospital full inquiry be made into the occupational history of the patient and the facts so obtained be intelligently correlated with the physical findings in the case and with proper data relating to the industries concerned, evidence of the greatest value must result. It is knowledge of this kind, accumulated in one institution or in many, by industrial physicians, by special investigators, and by private practitioners, which, classified and interpreted, is and is to be after all the only effective and just means of securing the advances in the prevention of industrial disease now so truly needed. It is readily to be seen that there is urgent need of better occupational statistics in hospitals, and they are to be obtained by the simple means of careful, intelligent inquiry where now there is unintelligent carelessness. Such statistics contribute not only to a higher standard of medical practice in the institution itself, but also very materially toward the success of efforts to eliminate the causes of industrial disease.

There should also be considered the fact that, by virtue of its position in the community as a seeker after truth and opportunities for service, the hospital is able as are few other agents to study the problems of industrial disease without the bias which does and must almost inevitably affect to some degree the researches of many men engaged in clinical work in industrial plants. There must be maintained in the hospital the most scrupulous standards of scientific honesty and a reasoning sense of fairness to both the patient and the patient's employer. With a reputation for invariable fair dealing the usefulness of the hospital in the field of industrial medicine is unlimited; but with a questionable reputation such an institution is wisely avoided by workmen and employers alike.

The second important relation of the hospital is in its obligation to teach the principles of industrial hygiene and industrial disease. There is among physicians a growing sense of their responsibility as teachers of better habits of life and work, and hospitals in like manner are becoming more truly educational centers in preventive medicine.

As new knowledge of industrial disease and its prevention is gained, the hospital should provide for the extension of such knowledge to its own staff or at least offer opportunity for that extension. If the hospital is affiliated with a medical school, there should be offered to medical students suitable instruction in this subject, preferably of a clinical nature. The continued progress of industrial medi-

cine, of course, depends upon the future interest and efforts of men now in medical schools.

There is an increasing demand for nurses in industrial plants, in part because it is the fashion of the day to institute "welfare work," in part because of the realization of the great usefulness of plant nurses, if they be given opportunity for usefulness. This demand will surely not decrease. If industrial nurses are to be properly prepared, nurses in training in either their regular or a postgraduate course must be schooled in the larger aspects of the problems they may face in industry.

Social workers, who are persons having much to do with both the immediate and end results of industrial health hazards, in almost any special province will work more efficiently if they have some knowledge of the physical effects of labor on the working man and woman and some knowledge of good hygienic standards.

Much may be accomplished with the individual patient by instructing him regarding the dangers to which he is exposed and the precautionary measures indicated. It is impossible accurately to reckon the usefulness of such instruction. It seems to parallel the parable of the sower. The lead poisoned litharge packer may return unconcerned to his packing forthwith, and the painter may for some days depart from his evil ways of lunching with paint-daubed hands, but in rare instances a circular of precautions for printers is reprinted and widely distributed, that it may be of benefit to many men.

A valuable extension of industrial preventive medicine is that which carries knowledge of the dangers of particular trades and processes, and knowledge of ways to avoid such dangers into the meetings of labor organizations and into the offices of employers and factory superintendents.

Another service for the industrial clinic of the hospital is in the field of vocational guidance, not alone for the youthful but for workers of all ages. Vocational guidance far too often results in a change of occupation. It should in most cases mean an adaptation of the workingman's methods of living and working to conform him to his old job, or to the old job made a less harmful one. Vocational guidance is a most important function of the medical profession, and it is such no less now of the hospital clinician than it has been of the family practitioner. No physician should prescribe for his patient a job regarding which he himself knows little or nothing, any more than he would prescribe for his patient an unknown drug.

The relations of a hospital to industrial hygiene may be many. For any individual hospital such relations must be limited and defined according to that hospital's industrial environment, the resources available, and the interest and time which can be devoted to the subject. But for any investment of effort, whatever it may be, the return is always overwhelmingly great.

MILK SUPERVISION AND ITS CONTROL.

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THE term "Milk" is from the Greek word meaning to press out with the hand and has come into general use in describing that fluid by which nature has made possible the continued existence of the human race.

Very little authentic information regarding the domestication of the cow is available. Wherever we find her mentioned, even in the earliest history, she was already in a state of servitude to man.

Just when or where the two met is very largely a matter of conjecture. It seems certain, however, that man found the earth populated with other wild creatures, among them the herbivorous ancestors of the present dairy cow. He must soon have observed that these grass-eating creatures were endowed by nature with that upon which their offsprings seemed to thrive.

I believe that the calf was the first dairyman and an object of interesting observation to the human creature looking for that with which to satisfy his ever-returning hunger.

It is a far cry, however, from those days when our ancestors drank the milk of the cow and called it good, to the present day, with the milk situation facing us in all its complexities.

Hamlets have grown into towns, towns into cities, and the cities have become great manufacturing centers, the workers in them depending upon workers in the country to furnish a milk supply.

Cities are concerned about the health of their people. Health officers have been appointed. Statistics on the death-rates from the different diseases bring several interesting facts to light. One of the most startling is the discovery that diseases are sometimes transmitted through the milk supply. The city's interest in its milk supply is here to stay, and efforts are being directed toward improvement from the community rather than the individual point of view.

The work of obtaining better milk for a city or town is second to none in importance, and if done at all, is worth doing well.

Whether through acquired taste or custom, because of a growing appreciation of its nutritive value, or because of its palatability, milk now occupies an important place in the diet of the people of the United States. According to estimates, consumers in this country pay out annually, for milk, the enormous sum of more than one billion dollars. These figures exceed the value of all the gold and silver taken from the mines of the world during the same period. One is impressed with the size of the industry.

Great sums of money are being expended in preparation for the hand-

ling and sale of still greater quantities of milk, which seem certain to follow. The rate of this increase will no doubt be influenced in no small degree by the consumer's opinion of its purity, freedom from disease, and his appreciation of its relative cheapness when considered from a food-value point of view. We may safely say that the milk industry will advance accordingly as it is standardized, its products made safe and their nutritive qualities brought to the attention of buyers through education; hence we see the vital need of milk supervision.

I do not like the word "inspection," for it seems to me that, if the best results are to be obtained, the milk supervisor should be to the consumers what the doctor and the school are to the family, and should do for the dairyman and the milk supply what system does for the factory, being mindful of the health of the former and educating them to appreciate good milk when obtained, recognizing the handicaps and intricate problems of the latter and assisting in overcoming them.

Regarding the producer's ability to produce good milk we find an international committee saying, "This committee believes that the production of a clean and reasonably safe milk is a comparatively simple process easily within the reach of all careful dairymen, if paid a price sufficient to induce them to become genuinely interested in its production."

Out of a full realization and understanding of this situation should come a few rules, necessary, workable, enforceable, and easily understood.

It seems to me that regulations which correct no faulty condition or bring about no improvement in the milk supply or dairy conditions, should be regarded in no other light than as a burden to the cause of better milk. Vicious regulations are to be avoided. Only through regulations drafted with intimate understanding of the field to be covered can best results in improving the milk supply be hoped for.

Personally, I like to think of regulations constructed and applied, so far as they can be, like a machine, the work to be done to determine the size of the machine; the whole so constructed that each cog and part while in motion will do what that cog or part was constructed to do; and so that when the work which each was molded to perform is finished, that particular part will immediately cease to draw on the power, and not hamper the movement of other parts or embarrass the smooth working of the whole; like the construction of a watch, not a wheel too many, not a cog too few, no duplication of effort, no jar or loss of motion.

By this I mean, let the inspection be done by one competent authority. Too many cooks spoil the broth. Unnecessary visits to the dairy by this authority should be avoided, for these visits usually needlessly take up the time of both producer and inspector. In other words, have a system which will tell you when things are going right and when wrong, and that will point out the place in which they are wrong. A definite plan of action is to be preferred to a hit-or-miss method of dealing with factors which determine quality in milk.

While rules and regulations in themselves have no mysterious power of bringing about improved conditions, when to these are added the efforts of a competent supervisor, they do become of value in securing better conditions in milk production; for the washing of udders, the sterilization of utensils, use of the covered pail, immediate cooling and the like, seldom come of themselves. Few of us, of our own initiative, do the best we know.

By turning to the statute books we find that we have both dictatorial and suggestive powers. Experience teaches us that the latter is the more powerful of the two in obtaining results. In a few cases the law has to be applied, but recourse to this should be resorted to only after all other channels have been tried.

The supervisor's relation to the dealer must also be coöperative and cordial, for he is aware of the fact that it is the producer and the dealer, not he, who actually handle the product and determine the effect of this handling on the quality of the product supplied.

Perhaps the work of obtaining a reasonably safe milk supply has been no greater in this country than in others; however this may be, it is a fact that we have taken much interest in the matter, and are perhaps further advanced in the problem.

To obtain better milk we must make it possible for producer A, who furnishes better milk than producer B, to get a better price. This means that consumers must appreciate the better milk in a financial way.

They who would be most successful in improving the milk supply of any city or town should realize that the quality of the four billion gallons of milk annually supplied our population of more than one hundred million is, and can still further be, influenced by our five million dairymen and their helpers, who in the day soon to close and in the morning yet to come, will arise, and through what they do or leave undone will determine the effect of this handling on the quality of milk which daily leaves their farms.

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Volunteer Aids of the Health Department.—Dr. Edgar H. Guild, health physician of Springfield, Mass., writing in *The American City* for September, 1917, describes a children's organization known as the "Home Helpers' League" which is proving very popular and successful in that city.

A league is formed in each of the graded schools and the membership is limited to girls of eleven years and upwards. Regular meetings of each league are held and at each meeting a nurse gives a short talk on the care of the baby, personal hygiene, care of the hair and teeth and general sanitation as regards the cleanliness of the city.

The members coöperate with the Health Department by reporting sick babies, dirty back yards, flies, garbage cans in improper order, and refuse.

The vacation time is made the period of intensive instruction while the work goes on throughout the year with somewhat lessened intensity.

The great increase in the numbers of reports of various kinds, visits, and talks and demonstrations at meetings of the leagues show fully the value of the leagues to the Health Department.

MOSQUITO GROWTH IN CATCH BASINS.

JOHN W. M. BUNKER,
Formerly Instructor in Sanitary Biology and Sanitary Inspector, Harvard University.

Read before American Public Health Association Sanitary Section, September 9, 1915. Received for publication January 19, 1917.

CAMBRIDGE, Massachusetts, is infested with mosquitoes. In the summer months one cannot sit out without the protection of screens without submitting to the annoyance of these buzzing, biting insects. In the regions to the north and west of the city there are swampy districts which abound in breeding places but these are at a distance of a mile to a mile and a half from the center of the city, which is free from any bodies of standing surface water. The regions in question are within a half mile of the Charles River, but as this is a large flowing body of water with clean shores it does not seem that many mosquitoes should arise from this source.

We believe that mosquitoes do not fly to great distances unless carried on the wind. In the case of central Cambridge, therefore, breeding places must be near by to account for the great prevalence of the mosquitoes. A survey of the back yards carried on by the Boy Scouts indicates that the back yards within a half mile radius of the University are reasonably clean and certainly free from tin cans and the sort of rubbish that provides many sources of standing water. To a large extent the houses are in such condition that it is reasonable to suppose that the gutters do not offer sufficiently large breeding places for the numbers of insects present.

A possible source, and by process of elimination the most probable source, is furnished by the catch-basins which are placed at nearly every street intersection to catch the surface drainage from the highways. There are about two thousand such basins in Cambridge scattered over an area of about eight square miles. These basins vary slightly in capacity but have on an average a water surface of 22 square feet. The depth is about 2 feet 4 inches.

In the investigation undertaken to determine what part these basins play in serving as breeding places for mosquitoes there were evidently several points to determine:

First: Do these basins serve as breeding places?

Second: If they do, do mosquitoes breed in them at all times of the summer season?

Third: What effect does rainfall have in changing the water in these basins?

Fourth: How can this source be mitigated?

During the summer of 1914 a study was made of eighteen basins situated on various grades of streets. Some were on well traveled, well paved streets; others on streets having a mediocre macadam surface; one on an unaccepted lane at the intersection with a through traffic street.

Through the coöperation of the street department these basins were cleaned by a squad of city workmen in the usual manner during the first few weeks in April. The inlet to each basin was stopped with a plank and the water bailed out with a pail on a rope. A workman in hip boots then descended into the nearly empty basin and removed any accumulation of sticks and leaves or other rubbish from the outlet. The basins of the whole city are thus cleaned once a year as a matter of routine. On April 24 a personal inspection of several of these basins was made.

The outlet to the sewer from these basins

is in all cases through some sort of trapping device which allows water from below the surface to flow out and which carries out the surface water only as it is displaced and mixed with the lower layers by incoming drainage.

The procedure followed in the investigation consisted of taking a measured sample from each basin in such a manner as to include only surface water insofar as possible, and transporting it to the laboratory where it was transferred to a battery jar for observation. It was felt that, inasmuch as the mosquito larvæ when undisturbed remain for the most part at the surface of the water, such a sample when examined for the presence of these wrigglers would give a fair indication of the number breeding in each catch-basin at the times of sampling. If these periods of sampling could be so arranged as to occur once per generation of mosquitoes, the season's catch would give an approximate comparative computation of the number breeding in the various basins throughout the season.

Various sampling devices were tried, each designed to take surface water only and to take the sample quickly. At first attempts were made to take a large quantity of water and strain it through cloth to concentrate the sample. This was impractical because of the large mass of rubbish always present which collected on the strainer, effectually hiding any mosquitoes or larvæ. Finally a tin can on a stick was adopted as the best sampler.

The man-hole cover was lifted off and a few seconds allowed for things to quiet down. The sampler was then lowered quietly to near the surface of the water and quickly plunged under to a certain mark and swept with the same motion in a lateral direction. By this means the sample taken was of surface water largely and there tended to sweep in with it any floating matter which was reached by the current created, including of course mosquito larvæ, eggs, and pupæ.

Later it was observed in a glass vessel that mosquito larvæ come up principally around the edges, so that a preliminary stirring up of the water in the basins was resorted to, to scatter the wrigglers, followed by a period of quiet long enough to allow the larvæ to return to the surface. From time experiments in the laboratory it was found that the larvæ stay under only for a short time when suddenly frightened, at most not more than 60 seconds, and usually not more than 30 seconds. At least a minute, therefore, was allowed to elapse between stirring up the water and taking the sample.

One half gallon samples were taken in this manner and transported to the laboratory in glass stoppered bottles in cloth bags. Notes were taken of the appearance of each basin during the short interval of waiting.

At the laboratory each sample was emptied carefully into a numbered battery jar and observed once a day for the appearance of larvæ or pupæ and the number recorded. Netting over the top of the jars served to entrap any insects that hatched out between periods of observation. Corrections were made for instance when a larva changed into a pupa or a pupa into an imago and in this way the corrected larval total for the week was taken as the index of the number of mosquitoes that would have hatched from that sample of water that week. It was judged that any eggs laid soon after the taking of a sample would appear in the next week's catch. From observations made in the laboratory it was assumed that the average time from egg to imago was on an average about seven or eight days, rather than the longer period of ten days more often assigned to this phenomenon in the literature. It was evident that seven days is sufficient time to carry the egg to the larval stage and to carry the young larvæ to the imago stage.

Inasmuch, therefore, as this work consisted in an enumeration of larvæ, largely, it was considered satisfactory to allow a period of time to elapse between samples sufficient to graduate the larvæ of one sampling period to the imago stage before taking the next sample. One week was, therefore, adopted as a convenient and suitable period of sampling. The method of computation adopted was considered to be accurate enough, considering the many possibilities of error in the procedure, to give at least a comparative result from week to week and between basins under various conditions.

A tabulation of the season's catch with the rainfall record of each preceding week and a daily temperature record was made at the end of the work.

On May 4, after six days of dry weather, the first catch of the season was made. One larvæ was captured in one basin. This was computed to represent twenty-two larvæ in that basin. The mean temperature was about 60° on that day.

No more wrigglers were captured until May 27 when larvæ were found in five basins. This was at the end of a hot, dry week and the temperature on the day of sampling was from 74 to 95. From 40 to 350 larvæ were indicated in each basin that yielded any at all.

The following sample day was cold again having a mean temperature of 60° and followed three rainy days, the heaviest fall being the morning of the sampling day and consisting of a smart shower with a precipitation of .1 inch. No larvæ were captured in any basin.

On June 10 three basins showed the presence of mosquitoes, and following that date, until July 29, only one basin yielded any at all, that one basin never failing to give a crop of from 30 to 150 per week as indicated by our method of sampling.

On July 29 seven basins showed the presence of wrigglers, and all during the month the crop was fairly heavy. Temperature ran high and the showers occurred for the most part early in the sampling week or not at all.

With the beginning of the month of September, for no evident reason, the number of basins yielding mosquitoes dropped to one and the number in that to one.

On September 16 the last larva was captured and on September 29, after two blank weeks, as the temperature was down to 46 the hunt was declared off.

It was found that we had direct evidence of the breeding of some 5,500 mosquitoes from eighteen basins of which 1,300 were from one basin alone. One basin failed to yield any during the run and one basin yielded only one for the season.

The total number did not at all fit with preconceived ideas and in the opinion of the author is not trustworthy as an indication of the quantity that actually were bred, because of the many chances for error in sampling.

There are, however, certain inferences to be drawn from the results obtained which are suggestive. One basin was a consistent producer of mosquitoes throughout the test and never failed to produce larvæ if any other basin did. When no larvæ were found in this basin, none were found anywhere else. The notes of the observer, taken at times of sampling, seemed to give the answer to the question raised by this apparent abnormal condition, and information from the street department was corroborative of the explanation deduced.

All the streets in the neighborhood under investigation are in the summer time oiled to keep down the dust. Inasmuch as the street surfacing of Cambridge is, for the most part, macadam there is considerable dust to keep down. Consequently the streets are oiled early and often during the summer. Naturally the city does not go

to the expense of oiling any unaccepted streets.

The basin which yielded the steady crop of mosquitoes was on an unaccepted street. The other basins were on accepted city streets. The note book record of observations shows that in all the cases, except the one prolific basin mentioned, there was usually evident upon the surface of the water in the catch basins a more or less thick oily scum. The basin which supplied the mosquitoes did not have such a scum. It was reasonable to suppose that this scum comes from the excess oil which runs off or which is washed off the roadway into the basins. Apparently the catch basins in Cambridge are, for the most part, kept automatically oiled by the street department, and where such is the case they do not serve as breeding places for mosquitoes to such an extent as they otherwise would.

Conclusions.

The conclusions which may be drawn from this investigation are as follows:

(1) Under ordinary conditions catch basins can and do serve as breeding places for mosquitoes.

(2) Depending on the season, mosquitoes may be expected to breed in catch basins in places of the same climatic conditions as Cambridge, Mass., from May to September.

(3) A sufficient amount of rainfall serves to wash out the basins to some degree and rid them of eggs and larvæ. This need be only .1 inch of precipitation if it be brisk.

(4) It is evident that oiling is efficient in reducing the number of mosquitoes coming from this source, and it appears that in some cases oiling of the streets to keep down the dust serves automatically to oil the catch basins.

Received for publication Jan. 19, 1917.

BRITISH MEDICAL PROFESSION APPROVES HEALTH INSURANCE.

How does the medical profession in England, after five years' practical experience, regard the Health Insurance Act? "Favorably," finds the British Medical Association after a painstaking inquiry among all local branches and panel committees. And, the Association's Committee remarks, "the degree of unanimity so far disclosed is somewhat remarkable."

The report, which has appeared in the *British Medical Journal*, points out minor defects in administrative detail that may be easily corrected and suggests that the scheme, which is proving a distinct gain to the medical profession as well as to the public health, be still further expanded.

The most important improvements recommended by the Committee and adopted at the Annual Representative Meeting of the Association relate to provisions not found in the existing British Act but contained in the tentative health insurance bill prepared by the American Association for Labor Legislation in coöperation with the American Medical Association, and now being studied by official commissions in eight states in this country with a view to legislation. These provisions, now found desirable by the British doctors, include the extension, under certain conditions, of the advantage of medical care to dependents of insured persons, and also the extension of the scope of medical benefit to provide *all* necessary medical care—specialists and nursing services, institutional treatment, maternity attendance, etc.,—instead of only that which can be furnished by the general practitioner.

Perfection of the existing panel plan and of the basis of payment for medical service is recommended, as against any immediate consideration of a new system in the direction of a state medical service, though the Association recognizes the need for an extension of the number of salaried medical officers in the field of preventive medicine.

NEW IDEAS IN FOOD CONTROL.

HARRY E. BARNARD, PH. D.
State Food Commissioner, Indianapolis, Ind.

Read October 25, 1916, at Cincinnati, Ohio, before a Special Meeting for Members of A. P. H. A., Interested in Public Health Aspects of Food and Drug Control.

THE time is opportune to discuss the history of pure food legislation, to detail the development of our present system of food control from a more or less political and altogether unsatisfactory dairy work of a quarter of a century ago. But I do not propose taking up valuable time with an historical discussion, and I shall establish a basis for my remarks with the assertion that present day food control is an endeavor to protect the public health by supervising the conditions under which the food supply is produced, handled and distributed.

The food department whose only effort is exercised for the prevention of food adulteration is occupying a minor field, is letting lie fallow or untilled a world of opportunities. Food adulteration is, save for the occasional lapse of ignorant offenders, a thing of the past. Food sanitation is the work of the present; the nutrition of the human family, the work of the future.

You who have gathered here to discuss foods and drugs are vitally interested in the problem of sanitary food control. You are, no doubt, already enforcing excellent sanitary food laws. You are providing for the protection of the food supply during the process of distribution just as carefully as you are watching its manufacture and eliminating unfit raw material. You are studying the health of the employee in the food factory, and if you are not already requiring a certificate of sound health from every worker with food, you are planning legislation which will enable you to throw this last and vitally important protection around the food supply. What we all thought but a few years ago was an impossible task has been successfully accomplished in the great city of New York, and what the department of health of that city has done, every state and city official ought himself to be able to do.

Recognizing the fact that typhoid fever, although it may be, and frequently is disseminated in an infected milk supply, by polluted water and through the common fly, is more frequently than we care to contemplate, a product of a human carrier; the food official working in the larger field must find a means to eliminate typhoid carriers from the ranks of food handlers. Whether we want to acknowledge it or not, the fact still remains that much of the typhoid which we have always with us is not due to the fly, is not due to the unsanitary outhouse, is not due to the polluted well, but it is due to the cook, to the waiter in the restaurant, to the helper in the dairy.

We have found a way to get at these facts and to eliminate the source of the infection. This is real work for the food inspector and a real function of pure food legislation. And now we are ready to plan for the future. Enormous strides have been made in recent years in the study of the nutritive value of foods, but it is only since Osborne, Mendel, McCollum and their associates began to give us the results of their studies that the new world of scientific feeding, potent with possibilities for a better nourished race, opened before us.

There is more than passing interest in the fact that practically the only real studies of nutrition reported up to a few

years ago were confined to the investigations of animal nutrition. The human family has been allowed to eat as casually as it has been permitted to mate. Fortunately the problem of feeding an animal and of a human is not greatly different, and when we have learned in our investigations that a hog cannot be successfully fed upon a single ration such as of corn or wheat, we have at the same time discovered a truth of value in the feeding of the child and of the adult. The ability of animals to utilize foodstuffs varies. The sheep thrives on food the dog cannot utilize at all. And yet the basic principles governing nutrition are in the last analysis as definite as the reactions in the test tube of the laboratory. The functioning of the living cell has not yet been explained, but we do know that the processes which go on within it are chemical processes which are varied, interrupted or accelerated just as are the processes with which the chemist is more familiar. Food officials have not had an opportunity to study this proposition. Their field of effort has been very largely given over to executive work.

I believe the future will see research laboratories, skilfully officered, built up as an important function of the food official's department. Such laboratories will discuss the problems of nutrition not only with a view to a better nourished race but to the end that we may be better fed at more reasonable cost. The average housewife in her buying is governed by her likes or dislikes rather than any real knowledge of food values as interpreted in terms of nutrition or of cost. The food official who wishes to serve best will do what he can to guide her in her buying. We are today approaching a crisis in food prices. Look where you will it seems it is impossible to find a single article of food which is really cheap. Of course certain foods are relatively cheap. Wheat at three dollars a bushel will yield a relatively cheap food. The work of the food official may well be directed toward informing the housewife who buys for the home what to buy that she may feed her family well and cheaply.

These are the things the food officials should do. And it is in the development of these new ideas, and by his entry into these larger fields, that he can best serve the community in which he works and build up a department which will do constructive instead of police work.

Court Plaster Examined for Tetanus.—Following the reports published in many of the newspapers, that specimens of court plaster sold in the West by itinerant vendors had been found to contain tetanus bacilli, the Department of Health, through its Bureau of Laboratories, examined a large number of specimens of court plaster sold in this city. In not a single instance were evidences discovered by any infection with tetanus. In the case of the positive findings reported by the newspapers, it is, of course, extremely improbable that this represents anything more than accidental infection. Certainly no one at all familiar with tetanus and attempting in such a fiendish way to kill his fellow-men with the germs of this disease would resort to court plaster as the vehicle of infection.

While, therefore, we do not take any stock in the suggestion that court plaster is being deliberately infected, we would advise the public to buy court plaster only from reputable druggists, and only the product of reliable manufacturers.—*New York City Weekly Bulletin*, August 18.

REPORT OF THE COMMITTEE ON STANDARD BACTERIAL METHODS FOR MISCELLANEOUS FOOD PRODUCTS.

THIS committee has considered the subject of bacterial examination of eggs and egg products. Through a circular letter all members of the Society of Bacteriologists were acquainted with the purpose of the committee and their cooperation secured. Many valuable opinions were secured through correspondence and personal visits. As a result of the work your committee recommends the following procedure for routine bacterial examination of eggs and egg products:

Shell Eggs.

For the routine work of a laboratory the bacteriological examination of shell eggs is not recommended, because in the enforcement of any law or regulation the bacteriological examination of a shell egg would have reference to the individual egg and give no definite relation to any of the number of individual eggs in the lot under examination.

Shell eggs are graded commercially by inspection either before the candle, out of the shell, or both. A trained person can distinguish the various grades of eggs by this method and can pass upon the sanitary quality with a reasonable degree of accuracy.

Eggs which appear good before the candle and whose shells are free from dirt, cracks or checks, are comparatively free from bacteria, at least, the small number found could not be considered of importance in determining the sanitary quality. High bacterial counts are found only in eggs, the inspection and candling of which would indicate that they were heavily infected or at least unfit for a food product.

For research work or special investigations where the bacteriological inspection of shell eggs is required, the methods of Pennington (U. S. D. A. Bul. 51) or Rettger (Storrs Agric. Exp. Sta. Bul. 75) will be found satisfactory.

Egg Products.

Selection of Samples.

Desiccated Eggs. Each sample should consist of at least one-half (½) pound. Samples should be collected from representative containers of the product in any individual shipment. The samples should be drawn from the package at least six (6) inches below the surface and by means of sterilized utensils, and placed in sterile containers.

Frozen Eggs. Frozen egg samples should constitute original unopened packages whenever possible. This should always be the case when the sample is to be forwarded to a laboratory by express for examination. When a sample is collected by a bacteriologist for immediate examination, one-half pound samples are sufficient. The samples should be taken by means of sterilized utensils and placed on ice in sterile containers. Samples should be collected from representative containers of the product in any individual shipment. It will be found convenient to use a sterile butter sampler of sufficient length to enable one to remove a core of the frozen material from the top to the bottom of the container. If the material is frozen too solidly, it may be found necessary to use a long-shanked bit and brace or augur and collect the shavings for the sample. Samples should be taken from at least three widely separated parts of the can and then mixed to form a composite sample. The butter sampler or bit should be thoroughly sterilized before use, either by dry sterilization or flaming in a Bunsen burner, either with or without previous dipping in alcohol. If it is necessary to take the sample with a spoon, the sample should be taken at least two inches below the surface and from at least three widely separated parts of the can.

No frozen egg samples should be examined bacteriologically that are not received in a frozen condition.

Transportation of Samples.

All samples should be sent to the laboratories in the quickest possible way and examination should be made immediately on receipt of sample. Frozen egg samples, when transmitted by common carriers, should be so packed as to prevent thawing.

Condition of Samples.

Records should be kept of the general condition of all samples at the time of arrival at the laboratory, the appearance of the product, color, odor, etc.

Technical Procedure.

The bacteriological examination shall be started as soon as possible after the receipt of the sample. All determinations for desiccated and frozen eggs shall be made on the gram basis.

In the case of frozen eggs, after the melting of the composite sample and before sub-sampling, it is advisable to mix the material thoroughly with a sterilized electric stirrer such as is commonly used at soda fountains to mix eggs, or, if such an instrument is not available, with a sterilized hand egg-beater.

Bacterial Counts.

Standard nutrient agar shall be employed and bacterial counts made at 37° C. after forty-eight (48) hours incubation and at 20° C. after ninety-six (96) hours. The committee also suggests for trial and criticism the use of litmus-dextrose-agar at 37° C. for forty-eight (48) hours. The determination of acid and alkali producing organisms is often invaluable in the interpretation of results. The procedure in plating and counting shall be made in accordance with the procedure as recommended in the Standard Methods of Water Analysis of the Association.

The following procedure is recommended:* Approximately five grams of the material shall be transferred to a tared sterile flask or bottle of about 100 cc. capacity and weighed to the nearest 0.01 gram. The weight of the material multiplied by nine gives the amount of sterile physiological salt solution to add to make a 1 to 10 dilution of the material. Thus, if the material weighed 5.1 grams, one should add 45.9 cc. of sterile salt solution to make a 1 to 10 dilution (5.1 x 9 = 45.9). From this point on the dilutions shall be made in the regular manner by transferring one cc. of the mixture to 9 cc. or 99 cc. dilution bottles of physiological salt solution. It will be found advisable to add glass beads or broken glass to the 1 to 10 dilution before shaking; this will help materially in getting a thorough mixture.

In the case of desiccated eggs, it is recommended to allow the mixture of egg and salt solution to stand for several minutes before shaking, in order to prevent particles of undissolved egg from sticking to the sides of the flask.

The following alternate method is suggested for trial and criticism: In a tared sterile flask of about 200 cc. capacity weigh out approximately one gram of the material to the nearest hundredth of a gram and dilute with 99 times this weight of sterile physiological salt solution. At intervals shake thoroughly until solution is complete and proceed with the subsequent dilutions and platings as recommended in the previous method.

*The use of 2 per cent. salt solution has been suggested for this initial dilution to facilitate the rapid solution of the egg protein. While the use of salt solution hastens the solution of many proteins, the committee is not in position at present to recommend any particular strength solution for this purpose. Criticisms and suggestions concerning this point are requested.

Determination of Bacteria of the B. Coli Group.

The quantitative determination of the presence of members of the B. coli group shall be in accordance with the current procedure recommended by the Committee on Standard Methods of Water Analysis.

W. R. Pinnell,
H. W. Conn,
Lester A. Round,
Carleton Bates, *Chairman*,
Committee Bacterial Methods for Miscellaneous Food.

REPORT OF THE COMMITTEE ON STANDARD BACTERIAL METHODS FOR MISCELLANEOUS FOOD PRODUCTS.

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Technical Procedure.

The bacteriological examination shall be started as soon as possible after the receipt of the sample. All determinations for desiccated and frozen eggs shall be made on the gram basis.

In the case of frozen eggs, after the melting of the composite sample and before sub-sampling, it is advisable to mix the material thoroughly with a sterilized electric stirrer such as is commonly used at soda fountains to mix eggs, or, if such an instrument is not available, with a sterilized hand egg-beater.

Bacterial Counts.

Standard nutrient agar shall be employed and bacterial counts made at 37° C. after forty-eight (48) hours incubation and at 20° C. after ninety-six (96) hours. The committee also suggests for trial and criticism the use of litmus-dextrose-agar at 37° C. for forty-eight (48) hours. The determination of acid and alkali producing organisms is often invaluable in the interpretation of results. The procedure in plating and counting shall be made in accordance with the procedure as recommended in the Standard Methods of Water Analysis of the Association.

The following procedure is recommended:* Approximately five grams of the material shall be transferred to a tared sterile flask or bottle of about 100 cc. capacity and weighed to the nearest 0.01 gram. The weight of the material multiplied by nine gives the amount of sterile physiological salt solution to add to make a 1 to 10 dilution of the material. Thus, if the material weighed 5.1 grams, one should add 45.9 cc. of sterile salt solution to make a 1 to 10 dilution (5.1 x 9 = 45.9). From this point on the dilutions shall be made in the regular manner by transferring one cc. of the mixture to 9 cc. or 99 cc. dilution bottles of physiological salt solution. It will be found advisable to add glass beads or broken glass to the 1 to 10 dilution before shaking; this will help materially in getting a thorough mixture.

In the case of desiccated eggs, it is recommended to allow the mixture of egg and salt solution to stand for several minutes before shaking, in order to prevent particles of undissolved egg from sticking to the sides of the flask.

The following alternate method is suggested for trial and criticism: In a tared sterile flask of about 200 cc. capacity weigh out approximately one gram of the material to the nearest hundredth of a gram and dilute with 99 times this weight of sterile physiological salt solution. At intervals shake thoroughly until solution is complete and proceed with the subsequent dilutions and platings as recommended in the previous method.

Determination of Bacteria of the B. Coli Group.

The quantitative determination of the presence of members of the B. coli group shall be in accordance with the current procedure recommended by the Committee on Standard Methods of Water Analysis.

W. R. Pinnell,
H. W. Conn,
Lester A. Round,
Carleton Bates, *Chairman*,
Committee Bacterial Methods for Miscellaneous Food.

*The use of 2 per cent. salt solution has been suggested for this initial dilution to facilitate the rapid solution of the egg protein. While the use of salt solution hastens the solution of many proteins, the committee is not in position at present to recommend any particular strength solution for this purpose. Criticisms and suggestions concerning this point are requested.

THE DIAGNOSIS OF SYPHILIS FROM SPECIMENS SENT TO THE LABORATORY.

DR. ADOLPH GEHRMANN,
Bacteriologist to Columbus Laboratories, Chicago, Illinois.

THE addition of syphilis diagnosis has greatly increased the work of all diagnostic laboratories, especially because the Wassermann test has been so extensively advertised. It may seem a simple matter to send a specimen to a laboratory and receive a prompt certain diagnosis in return, but we have found considerable difficulty with the specimens from a distance. I have reached the conclusion, that if we can get a piece of tissue from the initial sore or the suspicious lesion excised for direct examination or the serum collected as will be described, we can be assured of the most reliable results.

The only method that has proved efficient in our hands for determining the presence of spirochæte in preserved specimens is by the staining of tissue for their presence by the Levaditi method. We are making a considerable number of diagnoses in this way but it is not generally known that it can be done. There is also some disadvantage in that patients do not readily submit to cutting out a piece from the sore for examination. However, the tissue examination is extremely certain on early lesions and at the same time, it can be made quick enough to save the patient from an extended infection. The tissue specimen must be immediately preserved by 2 per cent. formalin solution.

In regard to serological work on blood that has been sent a distance, we have always held that we could not promise as close a reading of the Wassermann test as when we obtained the blood in the laboratory.

We have been in such uncertainty as to the outcome of tests that at one time we notified the doctors that if the test did not seem to conform to the clinical condition we would repeat the test if the patient would present himself at the laboratory. This, of course, is possible in some cases but not in all and then it may just be of utmost importance to have an immediate diagnosis established. There is no doubt but that some discredit has been put on the Wassermann test because of the simple failure in this one particular, that is to depend upon results made on unsatisfactory blood specimens.

We all desire to make this diagnosis efficient but should not go beyond reasonable certainty in promising results that may mean an entire change in the social relations and great expense to the patient or, on the other hand, a false security that may be dangerous to him and to his friends. From the fact that claims of great accuracy in Wassermann diagnosis have been so widely advertised, not alone physicians, but patients as well think that any kind of blood specimen sent to any laboratory will return a certain diagnosis. It is this state of affairs that has led me to look for some way by which we can get a reasonably clear and white serum for test instead of the usual muddy mixed blood that is sent to the laboratory.

The first requisite in serologic work is to have the serum for the tests in a perfect condition. Even when one has had some experience in taking these specimens it is not always a certain or easy thing to get a good specimen from every case.

The reasons for the unsatisfactory condition of sent in blood is due to:

1. Not enough specimen.
2. When it is lake colored.
3. Disturbance of the complement.
4. Contamination
5. Possible small amounts of preservatives.

The outfit that we are using for collecting blood for Wassermann is the simplest possible bottle and a needle; with directions so that the doctor simply cleans the arm and puts on a constrictor and allows the blood to run into the bottle, and sends it as it is. This is our ordinary collecting outfit. The different devices for use in obtaining blood for test include syringe,

vacuum bulbs or needles. Every extra manipulation or shaking of the blood quantity causes it to lake, and the only way to get clear serum is to allow a blood quantity to clot and expel the serum in as quiet a position as possible. The serum should then be drawn from the clot in the most gentle manner without in any way agitating the clot itself. If the blood can be drawn directly into centrifuge tubes and swung at once the clearest serum can be obtained, but to do this in the right way seems impossible for the average practitioner. We have tried many devices and changed our instruction and outfits repeatedly, but must conclude as stated above that simplicity gives the only chance for any fairly good and uniform results.

The outfit herewith presented makes it possible for the doctor to collect the blood and separate the serum partially in one operation and without centrifuge. Of course, there are some complications but they are slight compared to the advantage of a clear serum for our tests. The essential feature is a test tube with side arm and one cork. The side arm of the tube may be broken off and placed in the centrifuge when the outfit reaches the laboratory. It is best not to have the doctor break it off but to instruct him to send the entire tube with both serum and clot. It is then possible to see and use either or both parts of the blood for examinations.

INSTRUCTIONS FOR COLLECTING BLOOD FOR WASSERMANN TEST.

Have the following at hand ready for use:
Soap and water and 1: 1000 bichloride.
Alcohol and collodion.
Absorbent cotton.
A constrictor for the arm.
The outfit that we have sent.
Directions:
Clean up the arm over the median vein.
Put on the constrictor so that the vein shows.
Take the needle and the tube from the outfit and hold with the side arm up so that the blood will flow into the tube slanting.
Insert the needle and then let the blood run into the tube. *Now take off constrictor.*
Take out the needle and press cotton over the wound.
The tube with the blood should be placed in a slanting position with the cork inserted and the side arm *up*. When the tube shows serum over the clot then tilt it so that the serum runs into the side arm. Then push the cork in tight and pack it and send with directions to us.

A Man and His Arteries.—Writing in *The Nurse* for August, 1917, Dr. William Brady says that "old age is curable—if taken in time." The degenerative diseases of middle age are considered, particularly the A B C of middle age, namely, apoplexy, Bright's disease and cardiac degeneration.

The one attribute which distinguishes youth from old age is elasticity. Old tissues generally are more fragile and less elastic than young tissues. As the individual grows older, the arteries begin to harden. As the degeneration processes develop, more and more calcium or lime is deposited in the various coats of the arterial wall, and the artery continually diminishes its elasticity. The deposition of the lime eventually narrows the caliber of the arteries, giving rise to a high blood pressure.

The causes of arteriosclerosis may all be summed up in one word—toxemia. Drinking water which contains much lime, or eating foods which are rich in lime salts, have no causal relation in hardening of the arteries. Rather it is the use of animal nitrogenous foods, leading to putrefaction in the colon, the use of alcohol, and overeating which are important factors in arterial hardening. Syphilis, lead poisoning, and in some cases, the toxins of typhoid fever, influenza and other infectious diseases play a part in the production of arterio-sclerosis. The excessive use of tobacco is also supposed to be a factor.

The prevention of arteriosclerosis in middle life depends on the life and habits of the individual in his early life. A clean, normal living, recreation and exercise in the open air, a diet that limits animal protein and uses vegetables, and satisfactory bowel action will postpone old age in middle life.

Book Reviews.

Hygiene and Public Health. *Parkes and Kenwood. Sixth Edition with illustrations. Philadelphia: P. Blakiston's Son & Co., 1917. Pp. xi+787. Cloth, $4.00.*

This is decidedly an English book and is "printed in England." Both authors are Fellows of the Royal Sanitary Institute and are well known hygiene teachers. There are fifteen chapters and 706 pages. Including the comprehensive index there are 775 pages. The book is well printed on good paper and well bound. The 89 illustrations are clear cut and well selected.

Chapter I. *Water*, for an abridged treatise, satisfactorily disposes of the subject. A correction seems necessary where the statement is made that "steam boilers should be of wrought iron." All boilers are made of steel these days. The wrought iron boiler days have long since departed.

Chapter II deals with "*The Collection, Removal and Disposal of Excretal and other Refuse.*" This chapter is well written, but the reader who knows of the Kentucky privy and the chemical closet is pretty sure to think that had these been described and opinions given, the treatment of the subject would have been more complete.

The recent important studies of air and ventilation, which show that temperature and motion are of greatest importance, are not mentioned. The "allowable percentage" of CO_2 is rather extendedly discussed, and the authors seem from their text to fear draughts.

The Contagia is the title of Chapter IX. The divisions of this chapter are *The Contagia*, 344 pages; *Communicable Disease*, 134 pages, and *The Investigation of Disease Outbreaks, Modern Views on Isolation and Disinfection, Carriers of Disease, Isolation of the Infectious Sick and Hospitals*, are the remaining divisions. It is a plainly written chapter, without insistence upon what Hill calls "The New Public Health."

Disinfection is treated in the usual way as if it were a serious matter and without reference to Chapin and his views.

Six editions surely means popularity for a book and those who become owners of this one will not be dissatisfied.

J. N. Hurty.

The Four Epochs of Woman's Life. *By Anna M. Galbraith, M. D., Third Edition. The W. B. Saunders Company, Philadelphia, 1917. Pp. 296.*

Previous editions of this book have met with large success. Its wide circulation has been well deserved for it is exceedingly well planned, inclusive yet compact, and temperate in statement. The four epochs dealt with are, in alliterative sequence, maidenhood, marriage, maternity, and menopause. The most individual treatment is that given to marriage. It is desirable that this chapter be read by many men. The woman's point of view is seldom indicated with such candor and clearness.

The inequality of physical passion in the sexes is a fact which needs the fullest recognition. It imposes upon the rightminded husband obligations of forbearance and self-control. But the ideal of "intercourse for procreation only" is a standard of extreme austerity. It is hard to believe that those are the happiest married lives in which it obtains. Granting that the animal is over strong in man we may still condemn the abhorrence of the physical which artificial culture often fosters in women. "Companionship on a high plane" is to be commended but it is inferior to companionship on *all* planes. The psychoanalysts have shown us what grievous harm comes from repression in every realm of human life. This is not said without cordial endorsement of Doctor Galbraith's main plea for restraint and consideration on the part of the husband.

The book is non-committal on the subject of birth control as ordinarily understood. It strongly favors birth restriction by continence. The general hygienic teaching is excellent. It seems questionable whether the introduction of speculations concerning telegony and sex determination is wise. The layman is prone to give too ready credence to mere personal notions about these obscure matters.

Percy G. Stiles.

Water Purification. *Joseph W. Ellms. First Edition. McGraw-Hill Book Co., Inc., New York and London, 1917. Pp. 445; Ills. in text, 148. Price, $5.00 net.*

An up-to-date treatise on water purification, especially one suited to the requirements of the student and the non-engineering reader as well as of the engineer, has been needed for some years past. Ellms' book meets these specifications perfectly. The author is not only a water-works engineer of long and varied experience, but he has also been in close and sympathetic touch with the associated problems of chemistry, bacteriology, and epidemiology. He writes, therefore, with authority, and with a personal interest, which the reader cannot fail to sense, of those broader phases of water purification, which make this subject one of so great and so varied interest to sanitarians in general.

But with this breadth of treatment there is coupled, to an unusual degree for a work of this kind, an attention to detail which only the man on the works can give.

This book is unusually free of accidental errors, for a first edition, although the "balanced adenoids," figured on page 250, ought to be removed before the next edition.

The reviewer cannot agree that "chlorine or the hypochlorites are, therefore, merely agents for the production of oxygen under conditions which render it extremely active" (page 372), although this view is commonly held. There is ample evidence of a specified toxic effect of hypochlorous acid which makes it much more strongly germicidal than other agents of equal or greater oxidizing powers.

The book will prove of great value to public health officials and sanitarians, who desire to obtain a broad and general view of the problem of water supply. To the teacher, it affords an excellently arranged text, while the engineer, desiring concrete information on the details of construction or the theories underlying the processes of water treatment, will find it exceedingly serviceable.

Earle B. Phelps, Washington, D. C.

Women as Munition Makers—A Study of Conditions in Bridgeport, Connecticut, *by Amy Hewes, and* **Munition Workers in England and France,** *by Henriette R. Walter, New York. The Russell Sage Foundation, 1917. 8°. Pp. VII, 158. One map, 15 tables. Cloth, 75 cents net.*

The first two thirds of this little book comprises the summary of findings of Prof. Amy Hewes in an analysis of the social conditions of 165 women workers employed in the Remington Arms-Union Metallic Cartridge Company of Bridgeport, Conn. A special inquiry form was used and, from this, fifteen tables made up, showing among other things the last occupation before entering the munition industry, nativity, age, conjugal condition, occupation, daily and weekly hours of labor, lunch period, earnings, family incomes, rents and persons per room for each woman worker so studied. Permission was not obtained to carry the study within the plant. Investigation was made, for the most part, among women who had been residents of Bridgeport for at least two years prior to 1916, but considerably more than one half of them had had no previous factory experience. The one single product manufactured was cartridges. Severe accidents were not frequent, although occupational diseases appeared fairly numerous, particularly those affecting the skin. From a beginning of long hours of work as a customary procedure, Bridgeport gradually evolved into almost a model eight-hour-day city. Introduction of the three-shift system did most to bring this about. Wages were so high in the munition plant as to attract workers from other industries, although the analysis showed that there was no abnormally high rate of pay. The exact median earnings were $10.97, compared to a median of from $7.43 to $9.57 in the period just preceding the war in various industries in the city. As elsewhere, prices for commodities gradually rose and those who could not work were rendered more destitute than before, resulting in a rush to charitable institutions. Houses and living quarters became very scarce, rents mounted by leaps, the median increase being 22 per cent. The houses built by the company provided for only a fraction of those needing living quarters. Finally the city awakened to the situation and voted a sum of $2,275,000 for public improvements, while a house building company was organized and

planned houses to accommodate 1,000 families. Experts were secured in each field of endeavor and by mutual coöperation and a strong sense of civic pride most of the uneconomical situations were surmounted, although the writer laments that industrial conditions, night work for women and sufficient protection against accidents and industrial diseases, including proper compensation, are still inadequate.

Pages 97 to 102 give a very instructive historical résumé of the progress of industrial conditions in England from the beginning of the war to February, 1917.

These surveys are excellent guides both to industrial managers and to war-boom centers. Observance of their precepts should save much time, money, waste, labor disputes and suffering throughout American industries.

Emery R. Hayhurst.

Public Health Notes.

Abstracts prepared by M. P. Horowitz, R. R. Harkness and A. W. Hedrich.

Hospitals Needed for Tuberculous Negroes.—Dr. Martin F. Sloan, writing in the *Southern Medical Journal* for August, 1917, describes the urgent need of hospital facilities for tuberculous negroes.

"One of the greatest health problems of the South, and one that is receiving very little organized and systematic attention, is the care of the tuberculous negro. It is highly commendable of the southern states that, as a result of the energetic anti-tuberculosis campaign that has been going on for the past decade, there are in this section, according to the 1916 Directory of the National Association for the Study and Prevention of Tuberculosis, 59 sanatoriums of a public or semi-public character with a capacity of 4,130 beds. There are 15 other sanatoriums in process of construction, and there are 22 private sanatoriums with a capacity of 757. Of the 4,130 beds, only 114 are for negroes. It is a reflection upon the farsightedness of the people that less than 3 per cent. of the public beds are allotted to a race that constitutes 29.8 per cent. of the population and one that succumbs to the disease in the proportion of about 3 to 1 white."

Increase in the Price of Culture Media.—Because of considerable increases in the cost of raw materials, the Laboratory of Hygiene finds it necessary to raise its present prices on culture media. After July 15 the prices of media regularly supplied will be as follows:

Loeffler's blood serum, per tube.....	$0.025
Plain nutrient agar, per tube.....	0.04
Plain agar, in cans, per 1,000 grams....	1.50
Nutrient broth, in cans, per 1,000 grams	1.25
Peptone bile,* in cans, per 1,000 grams..	1.50
Endo agar, in cans, per 1,000 grams....	1.50

A rebate of 1 cent a tube for Loeffler serum tubes and 1½ cents for agar tubes will be allowed for such tubes as are returned to the laboratory clean and in good condition.

In accordance with the provisions of Chapter 13, Session Laws of 1914, the Laboratory of Hygiene is authorized to prepare and sell culture media to municipal laboratories, physicians, druggists, and other persons who may have need for such supplies.—*New Jersey Public Health News.*

* This does not contain lactose—1 per cent. lactose should be added before tubing.

THE OLD WAY

THE NEW WAY

Slanting Set on Drinking Fountains.—In the June, 1917, number of the JOURNAL, we published a review of the article of H. A. Whittaker on Infection of Drinking Fountains, which appeared in Public Health Reports for May 11, 1917. Whittaker recommended a fountain with protected nozzle and a slanting jet. By courtesy of the U. S. Public Health Service, we are permitted to show illustrations of the old and the new types of fountain.

Bile Outfits for Blood Cultures.—The Department of Health of Baltimore reports that the use of these will be discontinued as their use has proved unsatisfactory.

Revaccination against Typhoid Fever and Asiatic Cholera.—Santoliquido (*Office international d'hygiene publique*, April 1917) points out that, in the present state of our knowledge, immunity induced by vaccines against bacteria cannot be held to last over a year. In general, protective inoculation should be repeated at yearly intervals, but since there is apparently a sharp decrease in the degree of immunity in the second six months after vaccination, protection should not be held adequate beyond six months among subjects exposed to special risks of infection. Even at the end of a year, however, there remains a distinct resistance to toxic products, and careful inquiry among the Italian troops showed that the local and general reaction after revaccination is much less marked and lasting than after the first vaccination. Most of the soldiers revaccinated were able to stay on duty, and in the 10 per cent. of cases exhibiting a more marked reaction, the latter consisted merely of

transitory fever not exceeding 38° C. with a little headache and lassitude. Since the first two prophylactic injections in the initial series of three antityphoid inoculations are intended simply to prepare the organism for the third more powerfully protective injection, the first two injections in the revaccination may be omitted. In the same way, the first of the two anticholera injections may be left out. The single dose given should be somewhat larger than the third dose of the initial series, especially in the case of anticholera revaccination. The proper season for revaccination is winter in the case of typhoid and paratyphoid fevers and spring in the case of cholera.—From the *New York Medical Journal* for August 4, 1917.

✦

Saving Mothers.—A full discussion of the causes and prevention of maternal deaths and an analysis of available statistics, are contained in a report on maternity mortality, recently published by the Children's Bureau, Washington, D. C.

"More women 15 to 45 years of age die from conditions connected with childbirth than from any disease except tuberculosis. About 15,000 deaths from maternal causes occur annually in the United States, and the available figures for this country show no decrease in the maternal death-rate since 1900. Maternal deaths are largely preventable by proper care and skilled attendance.

"These 15,000 deaths do not measure the full extent of the waste. They are merely a rough index of unmeasured preventable illness and suffering among mothers. Furthermore, certain diseases of early infancy are closely connected with the health of the baby's mother and the maternity care she has received, and these diseases cause about one third of all the deaths occurring among babies under one year of age. More than 75,000 babies die each year from this group of diseases because they do not have a fair start in life.

"A more general use of existing provisions for scientific maternity care, and the extension of provisions for such care in all types of communities, should serve to reduce the number of deaths among mothers and babies, and to improve the health and general condition of children throughout the country."

Whooping-Cough Is Lessened by Vaccination.—In the *New York State Journal of Medicine* for September, 1917, Dr. G. W. Golen, health officer of Rochester, N. Y., describes his success in preventing whooping-cough by vaccination. Over 10,000 children were vaccinated against the disease, and of these less than 5 per cent. came down with the disease. The treatment consisted of three inoculations of pertussis vaccine, four days apart. The amounts used were 500 million, one billion and two billion units.

It was also noted that if the disease breaks out after vaccination that it is milder in character.

It is planned to vaccinate as many infants as possible.

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Red Cross Sanitary Units Formed to Protect Soldiers.—The *Official Bulletin* for October 9, 1917, announces that three more Red Cross Sanitary Units have been formed and have been assigned to Greenville, S. C., Macon, Ga., and Manhattan, Kans. The units will coöperate with the United States Public Health Service and the state and local health authorities in establishing full and efficient health organizations for the inspection of milk and water supplies, the control of infectious diseases, the eradication of malaria-bearing mosquitoes near camps, and the general sanitary inspection of the community.

✦

Infant Welfare Work in War Time.—In the *American Journal of Diseases of Children* for August, 1917, Dr. Grace L. Meigs sounds a warning against reducing our efforts to protect infants and pregnant mothers. At no time is the need for infant welfare work so keen as during the war period. The belligerent nations abroad —Great Britain, France, Belgium, Germany,— have all realized the importance of saving infants and protecting mothers, and have greatly increased their facilities for this work. Measures have been taken to protect the mother who is industrially employed, and to increase the number of infant welfare nurses; midwives have been carefully supervised, and free prenatal care and even confinement care have been provided.

And so, no diminution in the efforts to further the welfare of infants and mothers should be

permitted in this country. In fact the work should be extended as much as possible. There is great danger, however, that the organization which has been built up for the protection of infant life will be partly disrupted through the loss of physicians and trained nurses, who are entering the service of the country, in connection with the war.

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To Officers of the Medical Reserve Corps U. S. Army, Inactive List.—Word received from the surgeon-general of the U. S. Army conveys the information to officers of the Medical Reserve Corps of the United States Army, inactive list, that assignment to active duty may be delayed, and that they are advised to continue their civilian activities, pending receipt of orders. They will be given at least fifteen days' notice when services are required.

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"Medical Review" Absorbs "Pediatrics."—Pediatrics will no longer appear as a separate publication, but has been incorporated into the *Medical Review of Reviews*. Beginning with January, however, the *Medical Review of Reviews* will contain a special department devoted to pediatrics. This feature is but one of the improvements scheduled for the coming year. Important symposia are now in progress; the editor will contribute a second series of pathfinders in medicine, a staff of associate editors is being formed, and thus the *Medical Review of Reviews*, in entering upon its twenty-fourth annual volume, promises to be more serviceable to the medical profession than ever before.

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The United States Food Administration announces the creation of an Advisory Committee on Alimentation, the purpose of which is to gain the active coöperation of experts in the determination of policies of food control from the standpoint of the science of nutrition. The committee consists of C. L. Alsberg, Russell H. Chittenden, C. F. Langworthy, Graham Lusk, LaFayette B. Mendel and E. V. McCollum.

✠

The Influence of Barn Factors on the Germ Content of Milk.—In the *Creamery and Milk Plant Monthly* for September, 1917, there appears an extract from *Bulletin 109* of the University of Illinois Agricultural Experiment Station. The article deals with the work of M. J. Purcha and H. M. Weeter on the influence of barn conditions on the bacterial content of milk. Three barns were studied. One was very clean, one very dirty and the third was fairly clean. The utensils used were, however, thoroughly cleaned and sterilized in each case, just before milking. The investigators found that although the bacterial content of the milk produced in the worst barn was higher than that produced in the other barns, yet by the simple precaution of sterilizing the utensils, the bacterial count could be kept below 10,000 per cc. in each case. It is, therefore, concluded that the barn itself exerts little measureable influence on the germ content of milk.

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Hookworm Disease and the War.—Dr. C. W. Stiles calls attention to the important question of hookworm disease among soldiers and new recruits in *Public Health Reports* for August 17, 1917. Of 75 militia recruits examined at a Government reservation, Dr. Stiles found 47 with hookworm infection, 3 with Ascaris lumbricoides, 1 Hymenolepis nana, and 1 Strongyloides. Only 25 examinations were negative. The writer points out, that malingering and poor physical condition may be due in some cases to hookworm infection. The danger of an epidemic of hookworm in the trenches in Europe, if preventive measures are not taken, is also mentioned. There is also danger that the infection may become widespread in France and Belgium, necessitating large expenditures of money to eradicate the disease after the war. It is recommended that all the recruits from those states where the disease is prevalent should be examined for intestinal parasites and either treated in the American training camps or discharged.

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The Richmond (Va.) School of Social Economy, on October 1, began giving courses in public health and public health nursing.

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The School of Public Health of Johns Hopkins University will not open for candidates for a degree in hygiene until the fall of 1918.

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The New Haven (Conn.) Visiting Nurse Association offers a course in public health nursing, beginning November 1.

Health of School Children.—According to the *Medical Officer* for September 8, 1917, the mother, whose child is entering school for the first time, is sent a circular letter, informing her of certain essentials for the health of the child. This is the practice in Derbyshire, England. The letter considers such questions as adequate sleep and fresh air, the hygiene of the teeth, the use of handkerchiefs, mouth breathing, breathing exercise, the care of the eyes and the use of spectacles, pediculosis, adequate and proper clothing, the weight and height of children, and avoidance of constipation. The letter also recommends certain foods for breakfast, dinner and supper.

Suicide Mortality among Wage-earners in the United States.—The Metropolitan Life Insurance Company recently completed a study of suicide as a cause of death among its industrial policyholders. The study shows that during the past few years there has been a tendency for the death-rate from suicide to decrease markedly. Cases representing over 4,000,000 white males, and about 5,000,000 white females were examined. For the white males, the rate in 1916 was 15.3 per 100,000 and in 1915, 19.6 per 100,000. Among the white females the rate in 1916 was 6.3 per 100,000 and in 1915, 7.5 per 100,000. Thirty-one per cent. of the male suicides occurred by firearms, and about 35 per cent. of the female suicides occurred due to poisoning.

The negroes showed lower suicide rates than the white persons, the negro males at the same time showing a higher rate than the negro females.

It is demonstrated that suicide is more than twice as frequent a cause of death among males than among females. This is true at all periods of life except at the ages 15 to 19. The white male suicide rate increases with each age period, the rate being highest at the ages 65 to 74 when it is over 80 per 100,000.

Little Pure Zinc Oxide on the Market.—The Bureau of Chemistry of the U. S. Department of Agriculture has recently demonstrated that very little zinc oxide in the market complies with the standards of the U. S. Pharmacopœia. Nearly all the samples examined contained an excessive amount of lead.

Horse Flesh as Food.—The *Bulletin* of the Detroit Board of Health for June, 1917, states that several applications for licenses to slaughter horses and sell horse meat have been received in that city and regulations have been formulated under which such licenses will be granted.

"In addition to the usual restrictions governing the location and sanitary condition of all slaughter houses, the special rules governing the slaughtering of horses and sale of horse meat provide: That all horse meat sold in Detroit must come from horses slaughtered here and that all such horses must be inspected alive by a veterinary inspector of the Health Department; that the slaughtering must be done under the direct supervision of an inspector; that a thorough post-mortem inspection must be made of all organs for traces of disease and that the Mallein test for glanders must be made in the Board of Health laboratory, also that all horse meat shall be sold in shops that sell no other meat product and that such places shall be prominently placarded as horse meat shops. As the veterinary inspectors have been instructed to condemn and prohibit the killing of worn out and degenerated or diseased animals it is very doubtful if, under these restrictions, any horse meat will be offered for sale in Detroit until there is a much greater necessity and demand for it than exists today."

There is no reason why horse meat should not be as nourishing and as valuable an article of food as many other forms of meat now used; and there can be no valid reason why it should not be sold, provided that people using it know what they are buying and desire to use horse meat.

Mortality Chart of Infancy and Old Age.—The Registrar of Vital Statistics for Rochester, N. Y., has compiled a chart showing the reduction in infant mortality and the prolongation of life from 1884 to 1916. In 1884 only 11 per cent. of all the persons who died in Rochester lived beyond 70 years, whereas in 1916, 24 per cent. reached the age of 70 before death. Likewise in 1884, 378 infants per every 100,000 people died, as against only 229 infant deaths per 100,000 population in 1916. During the same period the number of deaths from 1 to 5 years diminished from 192 per 100,000 people to 80, a decrease of 57 per cent.

Relation of Infant Mortality to Subsequent Mortality.—In the *Medical Officer* for August 4, 1917, the question is raised whether the saving of infant lives leads only to an increase in the number of unfit and a heavier mortality in subsequent life. Karl Pearson maintains that it does. Dr. John Brownlee, Director of Statistics for the Medical Research Committee, is inclined to take a different viewpoint. It has been found that a child brought up in the slums till past the age of seven and then boarded out, does not maintain the same health as a child of three taken from the same environment. Dr. Brownlee believes that the improvement of the environment is the most important factor for the maintenance of a healthy race and suggests that the improvement of housing and provision of open spaces should be the main line of action.

Public Health Clippings.

Prepared by R. R. Harkness.

Paul Revere, First President, Boston Board of Health.—Interesting light is thrown upon the sanitary conditions in Boston 115 years ago, the rules of the Board of Health, its work and expenses by the report and rules of the board published in the *Massachusetts Mercury*, a Boston newspaper, in 1800.

All those who have studied the early history of Boston know that Paul Revere was a very prominent man in his day in this city and that he held many public offices, but it is not so generally known that he was also the first president of the Boston Board of Health.

The columns of the *Massachusetts Mercury* show that he was president of the Board of Health in 1799 and in 1800, and his annual report of the work and expenses of the board, published in the *Mercury* on March 18, 1800, shows these facts:

"The salary of the secretary of the board was $550 per year; the wages paid the messenger and the inspector of the board totaled $370 a year for the two officials. The fines collected and paid over to the town treasurer amounted to $419, and the net expenses of the board for the year were $4,401.28.

In reporting on the work of the board for the year ending March 12, 1800, Paul Revere says the board had "cleaned 137 vaults running on the surface of the earth; 27 offensive drains cleaned; 61 yards cleaned of filth and offal; 36 heaps of refuse removed from the streets; 13 ponds and cellars cleared and filled; 16 parcels of bad fish removed; 6 foul docks cleared; 5 nuisances on wharves removed; 10 dead horses and cows carried into the channel and sunk; 2 lots of bad hides sent out of town; 8 parcels of bad provisions seized in the market and destroyed; 6 offal carts carried from May 1 to November 1, 6,478 loads of filth from various wards."

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Some Early Regulations.—10. "All graves for the interment of the dead shall be at least six feet deep, and the proprietors of the several churches within the town, under which dead bodies are or may be deposited, shall cause at least three bushels of lime to be slacked under each of them once every 14 days, from the first day of June until the first day of October, next following, each year.

"15. No feathers shall be landed within the limits of the town of Boston before the same have been examined by some person authorized for that purpose by the Board of Health and a Certificate obtained from him that in his opinion the said Feathers are free from infection and may be landed without danger to the Health of the inhabitants of the town; nor shall any Hawkers or Dealers in Feathers expose for Sale in the streets any Feathers before the same have been in like manner examined, and a similar Certificate obtained."—*Boston Globe.*

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Advice on the Use of Patent Medicines.—For weak lungs: Purchase a nice chamois-lined chest protector. Put it on your pet poodle dog, and take ten deep inspirations (breaths) slowly

before an open window each morning. Retire to a warm bath room and take a cold sponge above the waist line. This do daily.

For constipation: Take three or four of Dr. Patent Medicine's Pink Pills. Roll each pill around the block, using your hand as propeller. Drink one pint of cold water before breakfast and at bedtime. Eat with regularity less meat and more vegetables. Wash your teeth with a toothbrush. Don't forget to thoroughly masticate your food.

For dyspepsia: Procure a box of Charcoal Dyspepsia Tablets. Put them in your flower pot. Charcoal is good for house plants. Go to your dentist and have your teeth cleaned and filled. Avoid anger. If fatigued, rest before eating. Select a good, wholesome diet, avoiding condiments and spices. Avoid midnight lunches, consisting principally of salads and coffee.—*North Carolina Health Bulletin.*

Milton Said It.—

"If thou will observe
The rule of not too much, by temperance taught,
In what thou eat'st and drink'st, seeking thence
Due nourishment, not gluttonous delight,
Till many years over thy head return,
So may'st thou live, till, like ripe fruit thou drop
Into thy mother's lap, or be with ease
Gathered, not harshly plucked, for death mature.—Paradise Lost."

—*East Orange (N. J.) Health News.*

Why a Birth Certificate?—

1. To establish identity.
2. To prove legitimacy.
3. To show when the child has the right to enter school.
4. To show when the child has the right to seek employment under the child labor law.
5. To establish the right to inheritance to property.
6. To establish liability to road and military duty, as well as exemption therefrom.
7. To establish the right to vote.
8. To qualify, to hold title to and to buy or sell real estate.
9. To establish the right to hold public office.
10. To prove the age at which the marriage contract may be entered into.
11. To comply with the law of the State of North Carolina.—*North Carolina State Bulletin.*

If.—If birth registration had been adopted in Illinois thirty-five years ago, conscription of recruits would have been simpler and fairer both for the nation and the individual.

If the reporting of tuberculosis by physicians had been made obligatory in Illinois ten years ago, as it was in many states, the problem of protecting the American army from the invasion of tuberculosis which has crippled the warring nations of Europe, would be a far simpler matter.

If the golden rule were universally observed, police power would never have to be invoked in public health administration. If the adults of the nation absorbed as much knowledge of public health as school children, morbidity and mortality would rapidly decrease.—*Illinois Health News.*

Notes and Nuggets.—Living for your country is just as patriotic as dying for it.

Every life saved from a preventable death is an added asset to your country.

The early detection and correction of a physical defect adds something to the efficiency of the individual.

There never was a time in the history of our race when Universal public health service was so badly needed nor when moral and physical stamina in individual and nation was so much in demand.—*North Dakota Health Bulletin.*

Efficiency and Service.—The trend of the times is towards efficiency. Concerns of all kinds are spending large sums of money to weed out inefficiency and to obtain one hundred cents worth of service for every dollar expended.

Many health departments throughout the country, Cumberland included, are spending large sums of money each year for the inspection of plumbing. In Cumberland this amounts to about one thousand dollars yearly. The question naturally arises, "Is the City of Cumberland getting one thousand dollars worth of returns for the money spent?" In our mind there is no doubt that we are *not* spending this money where the returns are largest.

In our last annual report we stated that "we have long ago abandoned the idea that 'sewer air' and 'sewer gas' is the cause of disease, and it has many times been shown that such air contains a less number of pathogenic bacteria than the ordinary street air." We also advocated the transfer of plumbing inspection to the building inspection department if such a department existed. Since the publication of our report several other health officers have placed themselves on record for the same change, all feeling the same, that by the transfer, the work will be placed where it rightly belongs.

We are hoping that such laws as may be necessary will be passed in the near future, that will enable plumbing inspection to be carried on by a department that can obtain the largest amount of good.—*Cumberland Health Bulletin.*

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Are We Eating Intelligently?—There never was a time when it was more important to emphasize the fact that we should eat to live and not live to eat.

Probably our greatest economic error in the past has been our enormous consumption of meat. This can be materially reduced without any loss to our bodies if proper substitutes are chosen. For those who have passed forty there should not be one, but two, three, or even four, meatless days a week, or an equivalent reduction of rations. This would be a decided advantage in prolonging life as well as an economy of food.

A regrettable economic waste is in the use of the so-called food fads, particularly the patent breakfast foods. Many of these breakfast foods, pound for pound are costing us from ten to fifteen times as much as do the old-fashioned breakfast foods such as oatmeal, rolled oats, rolled wheat, corn meal.

Inasmuch as with many, food is the heaviest expenditure of the home, constituting as it does from one third to one half of the weekly wage, it is imperative that we give the choice of our food more serious consideration. If we choose our foods intelligently, have them cooked intelligently, and eat intelligently, we could not only develop a fitter race but incidentally effect an enormous saving in the national expenditure. —*Toronto Health Bulletin.*

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Health is Wealth.—

He spent his health to get his wealth
And, then, with might and main,
He turned around and spent his wealth
To get his health again.

—*Buffalo Sanitary Bulletin*

Industrial Hygiene and Sanitation.

Abstracts prepared by Dr. Arthur Lederer.

Labor Legislation and Child-Welfare Laws Passed in 1916.—*Bulletin No. 213 of the U. S. Department of Labor, Bureau of Labor Statistics* reviews the labor legislation of 1916. *Bureau Publication No. 21* relates new provisions to those which they supplement or supersede and gives exact legal references for all material included. Laws affecting the welfare of children were passed during the year 1916 by each of the eleven state legislatures, holding a regular session, by the legislatures of the Philippine Islands and Puerto Rico, and by the Federal Congress.

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Indian Hill.—This is the name given to an industrial village which the Norton Company of Worcester, Mass., is building for its employees. This scheme represents one of the rare attempts in this country to create a clean, wholesome community for working people in which architectural beauty is one of the important considerations. Nobody will read the article of Charles C. May published by the National Housing Association of New York City without wishing that we had more such attempts of systematic town planning. Grosvenor Atterbury of New York is the architect. Indian Hill is a thirty-acre tract, several miles away from Worcester. The primary object of the project is to provide adequate housing for the employees of the Norton Company, with a view toward ownership, permanency and contentment in employment, and resultant general efficiency. The properties are sold to the workmen cheaply on an easy-payment basis.

A Successful Example of the Safety Movement.—Not a single passenger has been killed in a train accident on the Norfolk and Western Railway during the last five years, although in that period more than 34,000,000 persons have been transported.

Occurrence and Mitigation of Injurious Dusts in Steel Works.—The U. S. Bureau of Mines, in its efforts to improve health conditions in mining and metallurgical industries, is investigating the effects of dusts in mines and metallurgical plants on those employed therein. *Technical Paper 153*, published by the Bureau of Mines, and prepared by J. A. Watkins, treats of the effects of industrial dusts in steel works. From the standpoint of the industrial hygienists, no health hazard to which those employed in modern industries are exposed is of greater importance than that of a dust-laden atmosphere. This fact has become so generally recognized that many life insurance companies refuse to accept as risks those engaged in the so-called dusty trades. The publication deals with the origin of the dusts, the methods of sampling dusty air, the general methods of mitigating the dust hazards and recommendations pertaining to the abatement of dust in the steel industries.

Toxic Jaundice in Munition Works: A Review.—Toxic jaundice of industrial origin was up to the beginning of the present war practically always a form of arsenic poisoning caused usually by exposure to arseniureted hydrogen gas. A few cases of toxic jaundice had also been observed in Great Britain among workers in nitrobenzene factories. A few months after the outbreak of the war toxic jaundice appeared among the men employed in a large airplane works in England, and a few months later cases developed among workers in trinitrotoluol. The startling increase of this almost new industrial disease led to much careful study in England, the result of which appears in an article by Alice Hamilton in the August issue of the *Monthly Review of the U. S. Bureau of Labor Statistics*. For American authorities this information is of the greatest value, since the production and handling of the trinitrotoluol is increasing enormously in this country, and we have every reason to expect poisoning among the workers who handle it.

Certificates for Mine Rescue Training.—Training in the use of mine rescue apparatus was begun by the Government in 1908 as a necessary part of the work relating to the investigation of mine explosions. The Bureau of Mines, after its establishment in 1910, continued this training, and the work of its mine rescue stations and the course was extended to include instructions in first aid for the injured. On June 30, 1916, the total number of miners trained by the bureau since its organization was 42,045. *Technical Paper 167 of the Bureau of Mines*, compiled by D. J. Parker, contains the names of all the men to whom mine rescue certificates were issued during the period July 1, 1914, to June 30, 1916, with the place of residence or post office address. The paper is published with the intent of giving more effect to efforts to guard the lives of miners. The publication will enable state and mine officials to obtain with minimum delay the services of the trained men they are liable to need and will encourage more men to take the training and will help to maintain the interest and enthusiasm of those already trained.

The Proceedings of the First Industrial Safety Congress of New York State have appeared in bulletin form. The congress was held in Syracuse, N. Y., December 11–14, 1916, and many papers of great interest by leading men connected with this movement were presented.

The Industrial Commission of the State of New York has issued a bulletin containing the Workmen's Compensation Law of that state with amendments and additions to July, 1917. The Workmen's Compensation Law had been in effect three years on the first of July, 1917, administered by the Workmen's Compensation Commission during its first eleven months, and, since then by the State Industrial Commission.

The Joint Board of Sanitary Control in the Cloak, Suit and Skirt and Dress and Waist Industries in New York City has published its Seventh Annual Report. Organized and established in 1910, after the great strike in the needle trades, this board is the first institution of its kind. The primary aim of the board was to establish standards of sanitary conditions to which the manufacturers and unions should

be committed. The manufacturers and the unions obligated themselves to maintain such standards to the best of their ability and to the full extent of their power. The Joint Board of Sanitary Control is an experiment in industrial control. It legislates and sets standards. Seven years of work have proved that an industry is capable of taking care of itself. The improvements in safety, fire protection and sanitary conditions have been striking.

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Cost of Health Supervision in Industries.—An extremely valuable table has been compiled by M. W. Alexander of West Lynn, Mass., for the Conference Board of Physicians in Industrial Practice. The tabulation deals with the Cost of Health Supervision in Industry. It is the second compilation made. The first one was published in October, 1916. The present tabulation presents data for 1916 as reported by ninety-nine industrial plants, located in fifteen states. The total number of employees represented was 495,544; the average number per plant was 5,005; the maximum, 37,107; the minimum 141. The average cost of health supervision per person was $2.50 and, omitting four plants, which render unusual service, the average cost was $2.21. The aim of this compilation is to inform employers of the actual cost of health supervision of employees in different industries.

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The Proceedings of the Conference on Social Insurance, called by the International Association of Industrial Accident Boards and Commissions, Washington, D. C., December 5–9, 1916, appear in *Bulletin No. 212, U. S. Department of Labor, Bureau of Labor Statistics.*

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How France Returns Her Soldiers to Civilian Life.—This subject is embodied in a report to Surg.-Gen. G. C. Jones, director of Medical Services, Canadian Contingents, by John L. Todd, major. A short review of this important document can be found in the August issue of the *Monthly Review of the U. S. Bureau of Labor Statistics.*

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Medical, Hospital, and Surgical Treatment for Employees.—By Anice L. Whitney. A study of work for industrial betterment carried on by employers, covering a large section of the country and including many firms which are large employers of labor, was made recently by agents of the U. S. Bureau of Labor Statistics. Schedules were taken for 431 establishments, 375 of which, with a total of 1,204,010 employees, reported some provisions for giving medical treatment. Of these 375 establishments, 110 have first-aid equipment, 265 have hospital equipment, and 171 employ physicians. About 190 of the companies visited give free medical service in addition to accident service; 181 establishments employ trained nurses.—*Monthly Review of the U. S. Bureau of Labor Statistics,* September, 1917.

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Wholesale Prices in the United States, January to June, 1917.—The mounting cost of living in the United States is reflected in statistics of wholesale prices collected by the Bureau of Labor Statistics of the United States Department of Labor. For all commodities included in the bureau's investigation, aggregating 294 distinct articles, the increase for June over January was 23 per cent.

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Hoods for Removing Dust, Fumes and Gases.—A Special bulletin issued in May, 1917, under the direction of the New York Industrial Commission, gives the result of a careful study of various types of hoods for removing dust, fumes and gases, showing the inadequacy of certain kinds in use in some plants and describing hoods that are so constructed and adapted as to prove highly effective in accomplishing the purpose for which they are intended. It appears from the report that one of the most effective types of hood is that constructed with a double wall, with an allowance of one inch between the inner wall and the outer wall, at the edges of which there should be a minimum air velocity of not less than a thousand feet per minute and two hundred feet per minute over the central area of the hood.—*Monthly Review of the U. S. Bureau of Labor Statistics,* September, 1917.

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Vocational Education and Employment of the Handicapped with Special Reference to Crippled Soldiers.—An extensive bibliography on this subject may be found in the September issue of the *Monthly Review of the U. S. Bureau of Labor Statistics.*

Personal Notes.

Prof. Edward Bartow of the Illinois Water Survey Division has been commissioned a major in the Army Sanitary Corps to special work with the troops in France.

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Prof. Samuel C. Prescott of the Massachusetts Institute of Technology has accepted a majorship in the Army Sanitary Corps. At present he is giving instructions to army officers in food inspection.

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Dr. S. W. Welch has reorganized the Laboratory Staff of the Alabama State Board of Health. Dr. P. P. Salter has been appointed director and Mr. Edahl of Chicago first assistant.

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Mr. James A. Tobey, formerly health officer at West Orange, N. J., has resigned in order to become a chief sanitary inspector for the American Red Cross.

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Dr. D. C. Steelsmith, having recently completed a course at the Harvard-Technology School for Health Officers, has accepted the position of health officer for the City and County of Tuskaloosa, Ala.

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Dr. F. H. Wilmot has resigned as industrial physician to the Dennison Company at Framingham, Mass., in order to enter the War Medical Service.

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George T. Palmer, chief of investigating staff, New York State Commission on Ventilation, has been commissioned first lieutenant in the Sanitary Corps of the Army.

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Dr. R. C. Kirkwood, former superintendent of the Mt. View Sanitorium, Lakewood, Wash., has been appointed assistant chief of the Medical Service, U. S. Hospital for Tuberculosis, at Fort Bayard, New Mexico.

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Dr. F. G. Boudreau of Columbus, Ohio, has joined the Medical Reserve Corps for foreign service.

Dr. H. B. Roshon of Reading, Pa., has been commissioned lieutenant in the Veterinary Reserve Corps.

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The following have been elected to membership in the American Public Health Association:

H. V. Amerman, Kearny, N. J., Health Officer.

James Lindsay Andrews, M. D., Memphis, Tenn., Physician and Health Officer.

Frederick G. Barr, M. D., Dayton, Ohio, Physician.

Charles J. Bartlett, M. A., M. D., New Haven, Conn., Physician, Director of Laboratories, Connecticut State Board of Health.

Dr. Lela J. Beebe, Philadelphia, Pa., Physician, and at present student in Public Health.

John Hillman Bennett, M. D., Pawtucket, R. I., President, State Board of Health of Rhode Island; Superintendent of Health, Pawtucket, R. I.

Frank A. Blair, Chicago, Ill., Manufacturer.

Dr. Joseph Wilfrid Bonnier, Montreal, Can., Statistician of the Superior Board of Health of the Province of Quebec.

Charles H. Bower, M. D., Council Bluffs, Iowa.

Herbert E. Bowman, Ph. G., Somerville, Mass., Bacteriologist and Inspector of Milk and Vinegar, Somerville, Mass.

J. Bronfenbrenner, Ph. D., Boston, Mass., Assistant Professor, Preventive Medicine and Hygiene.

Hiram Byrd, M. D., State Board of Health, Jacksonville, Fla., Physician (Scientific Section, State Board of Health).

J. H. Brewster, State Department of Health, Albany, N. Y., Assistant Engineer in charge of Investigation of Milk Pasteurization Plant, State Department of Health, Albany, N. Y.

Dr. A. Diaz Brito, Habana, Cuba, Military Surgeon.

Herman R. Bundeson, M. D., Chicago, Ill., Supervising Medical Inspector.

R. L. Carlton, Winston-Salem, N. C., City Health Officer.

William R. Chynoweth, M. D., Sanitarium, Battle Creek, Mich., Physician.

B. C. Coebus, Chicago, Ill., Physician and Surgeon.

Leon A. Congdon, M. S., Topeka, Kans., Chemist and Sanitarian.

W. H. Cox, M. D., Jacksonville, Fla., State Health Officer.

Hugh A. Cowing, M. D., Muncie, Ind.

Arthur J. Cramp, M. D., Chicago, Ill.

John H. Crowe, M. D., Health Commissioner, Virginia, Minn., Physician and Surgeon.

Gaylord C. Cummin, City Manager, City Hall, Grand Rapids, Mich., Civil Engineer (actively in Public Health work).

George A. Dame, M. D., Inverness, Fla., District Health Officer.

Henry W. Denny, Trenton, N. J., Chief Chemist, State Health Department, New Jersey.

Fred S. Dodson, Framingham, Mass., Health Officer and Sanitarian, Community Health and Tuberculosis Demonstration.

J. D. Dowling, M. D., Birmingham, Ala., Health Officer, Jefferson County, Ala.

John J. Drake, Lackawanna, N. Y., Physician.

Martin Dupray, M. S., Akron, Ohio, Bacteriologist, Department of Health, City of Akron (in charge Division of Laboratories).

C. S. Emerson, M. D., Watertown, Mass., Physician.

Edward W. Finn, M. D., Dedham, Mass., Chairman Board of Health.

Luis Adam Galaneta, Secretaria de Sanidad, Habana, Cuba, Medical Doctor (Director General of Public Health of Cuba).

Mr. Weston Gavett, Baltimore, Md., Analyst.

V. H. Gwinn, M. D., Jacksonville, Fla., State Board of Health, District Health Officer.

A. C. Hamblin, Tampa, Fla., Physician.

Bertrand M. Hart, Onida, S. D., Physician and Surgeon

H. Nelson Heflin, M. D., Kewanu, Ill., Physician.

Samuel Heulings, New York, N. Y., Mechanical and Sanitary Engineer.

Earl Vernon Hill, M. D., Chicago, Ill., Physician.

Clarence W. Horton, Health Officer, Swampscott, Mass., Health Officer.

Archibald L. Hoyne, M. D., Chicago, Ill., Physician and Surgeon.

Clarence L. Hyde, M. D., Perrysburg, N. Y., Physician, Superintendent, J. N. Adam Memorial Hospital.

Linda James, B. A., C. P. H. (Miss), Cambridge, Mass., Executive Secretary of the Harvard Infantile Paralysis Commission.

H. O. Jones, M. D., Ph. G., Chicago, Ill., Division of Child Hygiene, Department of Health, Chicago.

Lyman F. Kebler, M. D., Washington, D. C.

Miss Mary B. Kirkbride, Albany, N. Y., Bacteriologist.

S. E. Lang, Winnipeg, Can., Inspector of Secondary Schools.

Dr. H. Lee Large, Rocky Mount, N. C., Physician, Superintendent of Health.

J. H. Larson, New York, N. Y., Secretary, New York Milk Committee.

R. Fred Lockwood, M. D., Lakewood, R. I., Physician and Surgeon, Health Officer and Milk Inspector.

E. F. Long, M. D., Lexington, N. C., Health Officer.

Raffaele Lorini, M. D., Coronado Beach, Cal., Physician and Surgeon, Health Officer of Coronado.

E. DeM. Lyon, M. D., Peekskill, N. Y., Health Officer.

William W. MacDonnell, M. D., Jacksonville, Fla.

George W. McCoy, Washington, D. C., Physician, Director Hygienic Laboratory, U. S. Public Health Service.

C. E. McKee, Wilmington, N. C., Sanitation-Industrial Villages, Rural Conditions.

Richard M. Olin, M. D., Lansing, Mich., Secretary, Board of Health.

Wallace M. Pearson, Flint, Mich., Chemist.

Thomas J. McLaughlin, M. D., Woonsocket, R. I., Health Officer, State Board of Health.

Charles R. Mahady, M. D., Rome, N. Y., Health Officer.

W. F. Martin, M. D., Battle Creek, Mich., Physician.

James A. Massie, M. B., Santa Fé, N. M., Surgeon, President, New Mexico Board of Health and Medical Examiners.

Melvin F. Master, B. S., Lowell, Mass., Chemist (Inspector of Milk, Vinegar and Oleomargarine).

K. E. Miller, Assistant Surgeon, Tarboro, N. C., Physician, County Health Administration.

Robert E. Mills, M. A., Toronto, Can., Statistician Chief, Division of Records and Statistics.

John E. Monger, M. D., Columbus, Ohio, State Registrar of Vital Statistics.

Mantrias Nicall, Jr., M. D., Albany, N. Y., Deputy Commissioner of Health.

Werner Nygren, Consulting Engineer, practicing in Heating, Ventilation, and Steam Engineering.

George R. O'Donnell, M. D., Waltham, Mass., State District Health Officer.

George Thomas Palmer, M. D., Springfield, Ill., Physician, President, Illinois Tuberculosis Association, Assistant Director, Public Health, Ill.

Raymond A. Pearson, President, Iowa State College, Ames, Iowa, Assistant Secretary, U. S. Department of Agriculture.

I. F. W. Plagge, Deerfield, Ill., Chemist.

Horatio M. Pollock, Albany, N. Y., Statistician and Editor.

Prudential Insurance Co. of America, Newark, N. J., Corporate Member.

Albert J. Read, M. D., Battle Creek, Mich., Physician.

William F. Reasner, M. D., Chicago, Ill., Physician, Supervisor Food Store Inspection, Department of Health, Chicago.

Charles L. Reeder, Tulsa, Okla., Physician, Superintendent, Tulsa Board of Health.

F. M. Register, M. D., Jackson, N. C., Superintendent of Health, Northampton County.

W. Scott Ritenour, M. D., Xenia, Ohio, Physician, now taking Health Course in University of Pennsylvania.

Dana E. Rouse, M. D., M. S., Columbus, Ohio, Physician and Sanitarian.

Jules Schevitz, Oklahoma City, Okla., Secretary, Oklahoma Association for Prevention of Tuberculosis.

Louis Schneider, M. D., Newark, N. J., Physician, Essex County Isolation Hospital, Soho, N. J.

Mrs. William E. D. Scott, Secretary, Connecticut Research Association, Greenwich, Conn.

Carl Oscar Seaman, Health Officer, Manchester, N. H.

Frank J. Sherman, Ballston Spa., N. Y., Physician and Surgeon.

Edgar Thomson Shields, Lewisburg, Pa., Medical (Specialty Tuberculosis).

Dr. John O. Skinner, Superintendent, Columbia Hospital, Washington, D. C., Physician.

H. O. Snow, M. D., Tampa, Fla., Health Officer.

A. T. Smith, New York City, Civil Engineer.

Henry H. Smyth, Philadelphia, Pa., Secretary of Board of Health.

Horace C. Swan, M. D., Hartford, Conn., Professor, Physiology and Physical Training.

Edgar Sydenstricker, U. S. Public Health Service, Spartanburg, S. C., Public Health Statistician.

F. L. Tatum, De Funiak Springs, Fla., Physician.

C. E. Thorkelson, B. S., Racine, Wis., Health Officer.

Dixie Bohon Tucker, M. D., Stillwater, Okla., Physician, Rural Sanitation in Oklahoma.

A. W. Underwood, M. D., St. Augustine, Fla., Physician, District Health Officer.

Harry M. Wallace, M. D., Greenville, Va., Health Officer, Augusta County.

Arthur L. Walters, M. D., Indianapolis, Ind., Physician.

Willard E. Ward, Brookline, Mass., Agent, Board of Health, for Inspection of Milk and Food.

F. L. Watkins, M. D., Jacksonville, Fla., Statistician.

William H. Welch, M. D., Baltimore, M. D., Physician, Director School of Hygiene and Public Health, Johns Hopkins University; President, State Board of Health.

Chester G. Wigley, Trenton, N. J., Sanitary Engineer.

M. B. Williams, M. D., Wheeling, W. Va., Physician, Commissioner of Health.